Series 1958, No. 1

Issued April 1961

SOIL SURVEY

Bradley County Arkansas

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
ARKANSAS AGRICULTURAL EXPERIMENT STATION

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Bradley County will help farmers in planning the kind of management that will protect their soils and provide good yields; it will assist engineers in selecting sites for roads, buildings, ponds, drainage structures, and other structures; it will assist those interested in establishing or improving woodland; and it will add to the soil scientists' fund of knowledge.

In making this survey, soil scientists dug holes and examined surface soils and subsoils; measured slopes; and observed differences in growth of crops, weeds, and trees. They recorded everything about the soils that they believed might affect their suitability for farming, forestry, engineering, and related uses. The scientists plotted the boundaries of the different soils on aerial photographs. Then cartographers prepared from the photographs the detailed soil map in the back of this report. Fields, woods, roads, and many other landmarks can be seen on the map.

Locating the soils

You can use the index to map sheets to find out which sheet of the large map covers the area you wish to study. The index is a small map of the county, on which numbered rectangles have been drawn to indicate what part of the county is shown on each sheet of the large map. Boundaries of the soils are outlined on each sheet, and each kind of soil has a special symbol. All areas marked with the same symbol are the same kind of soil, wherever they appear on the map.

Suppose, for example, an area located on the map has a symbol SaC2. The legend for the detailed map shows that this symbol identifies Saffell gravelly fine sandy loam, eroded gently sloping phase. The Sa part of the symbol stands for the Saffell gravelly fine sandy loam soil type. The C part of the symbol is given to all of the gently sloping soils. The 2 indicates the degree of erosion, in this example, moderate. This soil and all the others mapped in the county are described in the section, Descriptions of Soils.

Finding information

Few readers will be interested in all sections of the soil report, because it has special sections for different groups. The section that describes the physiography and climate and gives a few statistics on agriculture will be of interest mainly to those not familiar with the county.

Farmers and those who work with farmers can learn about the soils from the sections, Descriptions of Soils, Capability Groups of Soils, and Estimated Yields. In this way they first identify the soils on their farms and then learn how these soils can be managed and what yields can be expected. The soils are grouped into capability units, that is, groups of soils that need similar management and respond in about the same way. For example, Saffell gravelly fine sandy loam, eroded gently sloping phase, is in capability unit IIIe-1. The management this soil needs will be described under the heading, Capability unit IIIe-1, in the section, Capability Groups of Soils.

Foresters and others interested in management of woodlands can refer to the section, Use of Soils for Growing Wood Crops. In this section the types of forest are mentioned, the soils in different woodland suitability groups are described, and some factors affecting their management are explained. Saffell gravelly fine sandy loam, eroded gently sloping phase, is in woodland suitability group 5.

Engineers can refer to the section, Engineering Properties of the Soils. Tables in that section show the texture of soil layers, drainage, and other characteristics of the soils that affect engineering.

Soil scientists can find information about how the soils were formed and how they were classified in the section, Formation, General Characteristics, and Classification of Soils.

Soil terms that may be unfamiliar to some readers are defined in the Glossary. The guide to mapping units, capability units, and woodland suitability groups, on the last pages of this report, lists the mapping units, gives the map symbol, capability unit, and woodland suitability group of each, and tells where to find information about each soil.

* * * * *

This soil survey was made as part of the technical assistance furnished by the Soil Conservation Service to the L'Aigle Creek Soil Conservation District.

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Series 1958, No. 1

Issued April 1961

SOIL SURVEY OF BRADLEY COUNTY, ARKANSAS

Report by FRED C. LARANCE, Soil Conservation Service

Soils surveyed by FRED C. LARANCE, in charge, HARDY CLOUTIER, and JAMES E. JAY, Soil Conservation Service, United States Department of Agriculture

United States Department of Agriculture in cooperation with Arkansas Agricultural Experiment Station

BRADLEY COUNTY is in the southeastern part of Arkansas (fig. 1.) Its total area is 415,360 acres, or about 649 square miles. The greater part of this county is in woodland, and the chief industries are related to timber production. During slack seasons in agriculture, many farmers work in the woods or at the large lumber mills in Warren. Many farms are only a secondary source of income. This trend has been especially apparent since World War II.

This survey, made jointly by the United States Department of Agriculture and the Arkansas Agricultural Experiment Station, was designed to provide a basis for the best agricultural use of the land. The fieldwork was completed in 1958. Unless otherwise stated, information in this report refers to conditions at that time.

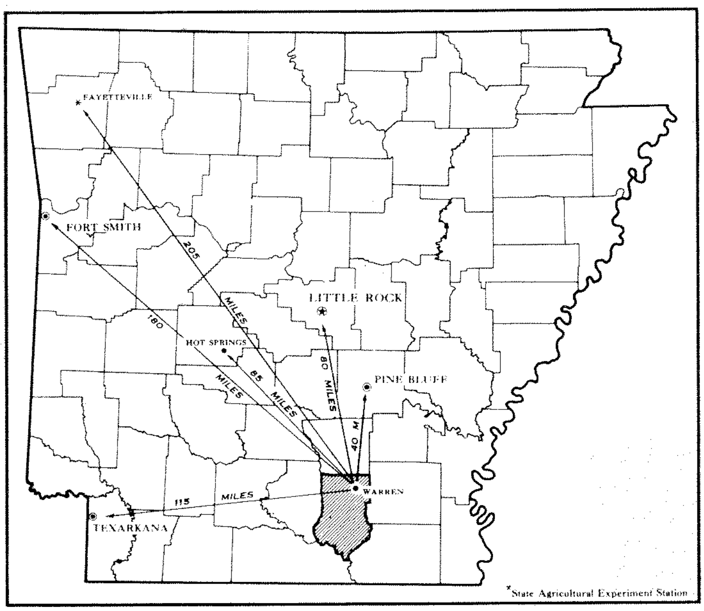

Figure 1.—Location of Bradley County in Arkansas.

General Soil Map

There are about 80 different soils in Bradley County. Their general pattern is shown in figure 2. This small map is not detailed enough for planning operations on an individual farm, but it is useful for getting a broad picture of the general nature and distribution of the soil resources in the county.

Each of the general soil areas is named for the dominant soils. The different soils occur in a characteristic pattern within each general soil area. In most places the pattern is related to the nature of the soil materials and to the shape of the land surface.

Descriptions of the general soil areas in Bradley County follow.

1. MYATT-STOUGH-PRENTISS: POORLY DRAINED TO MODERATELY WELL DRAINED, LEVEL TO NEARLY LEVEL SOILS ON STREAM TERRACES

This general soil area lies on broad, poorly drained flats. It covers about 25 percent of the county.

The Myatt soils, which are on the level areas, comprise more than 85 percent of this general soil area. They are poorly drained. Their subsoil ranges in texture from silt loam to silty clay.

The Prentiss and Stough soils are nearly level. They comprise about 10 percent of the area. The Prentiss soils are moderately well drained, and the Stough soils are somewhat poorly drained. The Prentiss soils have a yellowish-brown sandy clay loam subsoil. The Stough soils have a light yellowish-brown sandy clay loam subsoil that is mottled with gray and brown. Both the Prentiss and the Stough soils have a compact layer that begins from 12 to 40 inches below the surface.

A few small areas of Cahaba, Kalmia, and Leaf soils are included. The Cahaba and Kalmia soils are sandy and well drained. The Leaf soil is poorly drained and has a heavy clay subsoil.

Over 95 percent of this area is in woodland of pines and hardwood trees. The few small farms are on the better drained soils, such as Prentiss, Cahaba, and Kalmia. Yields of cotton, corn, tomatoes, peas, and lespedeza are better than average for the county.

2. BIBB-OCHLOCKONEE-CHASTAIN: POORLY DRAINED TO WELL DRAINED SOILS ON BOTTOM LANDS

This general soil area is on bottom lands that are frequently flooded. It covers about 30 percent of the county.

The Bibb soils are the most extensive in this general soil area. They are poorly drained. Their surface soil is gray to light gray, and below it is mottled brown and gray silty clay. The Chastain soils are similar to the

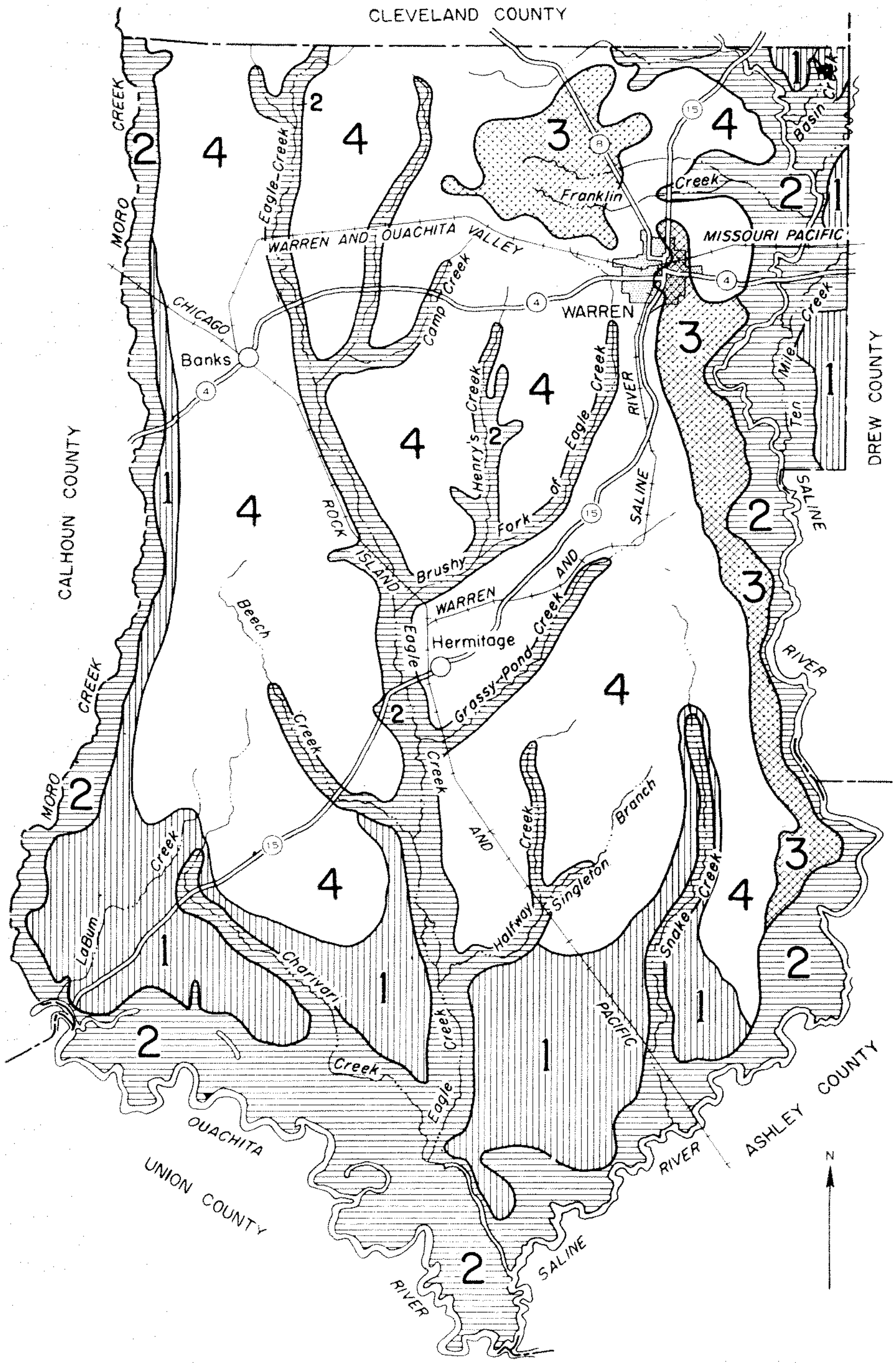

Figure 2.—General soil areas.

1. Myatt-Stough-Prentiss: Poorly drained to moderately well drained, level to nearly level soils on stream terraces.
2. Bibb-Ochlockonee-Chastain: Poorly drained to well drained soils on bottom lands.
3. Wilcox-Boswell: Nearly level to moderately steep soils that have heavy clay subsoil, on uplands.
4. Savannah-Ruston-Saffell: Nearly level to sloping soils that have sandy clay to sandy clay loam subsoil, on ridge tops and slopes.

Bibb soils in color, but they contain more clay in their subsoil.

The Ochlockonee soils are the best drained in this area. They lie on the natural levee ridges bordering the streams. Their surface soil is brown and ranges in texture from silt to fine sandy loam. Their subsoil is light-brown sandy loam.

Small tracts of Iuka and Mantachie soils are scattered over this area.

About 99 percent of this area is covered with hardwood trees. Some tracts of Ochlockonee soils that can be protected from floods are used for row crops. Some of the other soils are used for pasture.

3. WILCOX-BOSWELL: NEARLY LEVEL TO MODERATELY STEEP SOILS THAT HAVE HEAVY CLAY SUBSOIL, ON UPLANDS

This general soil area consists of a long narrow strip that borders the Saline River on the eastern edge of the county, and of small areas just south and north of Warren. Most of it is sloping to moderately steep. It covers about 6 percent of the county.

The Wilcox soils, some of which have slopes of as much as 30 percent, make up about 95 percent of this area. Generally, Wilcox soils have a surface soil of silty clay loam and a subsoil of heavy clay mottled with red and gray.

The Boswell soils have a surface soil of very fine sandy loam. The subsoil consists of red clay over mottled red and gray clay. A few small tracts of Sawyer soils are included.

About 96 percent of this area is in woodland of pines and hardwood trees. Some small tracts are used for small grains or pasture. Most of the acreage that was cultivated at one time has been allowed to return to woodland by natural reseeding or has been planted with pine seedlings.

4. SAVANNAH-RUSTON-SAFFELL: NEARLY LEVEL TO SLOPING SOILS THAT HAVE SANDY CLAY TO SANDY CLAY LOAM SUBSOIL, ON RIDGE TOPS AND SLOPES

This general soil area lies on the higher ridges that run north and south in the northern two-thirds of the county. It covers about 38 percent of the county.

The Ruston and Saffell soils are on the higher parts of the ridges, and the Savannah soils are on the lower parts.

The Savannah soils make up about 40 percent of the area. They are not so well drained as the Ruston and Saffell soils. The subsoil of the Savannah series is yellowish-brown sandy clay loam. It contains a compact layer at a depth of 18 to 30 inches.

The Ruston soils cover 30 percent of the area. They are well drained. Their subsoil is reddish brown and ranges in texture from sandy clay to sandy clay loam.

The Saffell soils cover about 15 percent of the area. They are well drained. Their surface soil contains a large amount of gravel. The subsoil is reddish brown. It ranges in texture from sandy clay to sandy clay loam and also contains a large amount of gravel.

Other soils in this area are of the Sawyer, Shubuta, Pheba, Lewiston, Orangeburg, Caddo, and Tickfaw series.

Most of the suitable cropland of the county is in this area. The Ruston and Orangeburg soils are especially good for early vegetables and tomatoes. The principal crops are cotton, corn, small grains, potatoes, and hay. The chief pasture plants are dallisgrass, bermudagrass, carpetgrass, whiteclover, and lespedeza.

Capability Groups of Soils

Capability grouping is a system of classification used to show the relative suitability of soils for crops, grazing, forestry, or wildlife. It is a practical grouping based on the needs and limitations of the soils, the risks of damage to them, and their response to management. In this report, soils have been grouped on three levels above the soil mapping unit. They are the capability unit, the subclass, and the class.

The capability unit, which can also be called a management group of soils, is the lowest level of capability grouping. A capability unit is made up of soils similar in kind of management needed, in risk of damage, and in general suitability for use. The capability unit is represented by the figures 1, 2, and 3 in the classification symbols, IIe-1, IIe-2, and IIe-3.

The next broader grouping, the subclass, is used to indicate the dominant kind of limitation. The subclass is represented by the small letter following the class number in the symbols. The letter symbol "e" means that the main limiting factor is risk of erosion if the plant cover is not maintained. The symbol "w" means that excess water retards plant growth or interferes with cultivation. The symbol "s" means that the soil is droughty or alkaline or has a compact subsoil.

The broadest grouping, the class, is identified by Roman numerals. All the soils in one class have limitations and management problems of about the same degree, but of different kinds as shown by the subclass. All the classes except class I may have one or more subclasses.

In classes I, II, and III are soils that are suitable for annual or periodic cultivation of annual or short-lived crops.

Class I soils are those that have the widest range of use and the least risk of damage. They are nearly level, well drained, free from flooding, fairly fertile, and not otherwise limited. They can be cultivated with almost no risk of erosion and will remain productive if managed with normal care.

Class II soils can be cultivated regularly, but they do not have quite so wide a range of suitability as class I soils. Some class II soils need moderate care to prevent erosion. Other soils in class II may be slightly droughty or slightly wet.

Class III soils can be cropped regularly, but they have a narrower range of use. They need even more careful management.

Class IV soils are even more limited in use than soils in class III, but they can be tilled part of the time or with very careful management.

In classes V, VI, and VII are soils that are not suitable for cultivation, or on which cultivation is not advisable. They can be used for pasture, for woodland, or for wildlife shelter.

Class V soils are nearly level or gently sloping, but they are droughty, wet, frequently flooded, low in fertility, or otherwise unsuitable for cultivation.

Class VI soils are not suitable for crops because they are steep, droughty, eroded, or otherwise limited, but they give fair yields of forage and fair to high yields of forest products. Some soils in class VI can, without damage, be cultivated enough so that tree seedlings can be set out or pasture crops planted.

Class VII soils provide only poor to fair yields of forage. Yields of forest products may be fair to high. The soils have characteristics that severely limit their use for pasture and, in some places, for woodland.

In class VIII are soils that have practically no agricultural use. Some areas have value for watershed protection, wildlife shelter, or scenery. None of the soils in Bradley County are in class VIII.

The soils of Bradley County have been grouped into the following classes, subclasses, and units.

Class I.—Soils that have few limitations that restrict their use.

Unit I-1.—Well-drained, level, bottom-land soils that have a silt loam or fine sandy loam surface soil and a sandy loam to silty clay loam subsoil.

Unit I-2.—Moderately well drained, level soils that have a sandy loam surface soil and a silty clay to sandy clay subsoil that contains a panlike layer.

Class II.—Soils that have some limitations that reduce the choice of plants or require moderate conservation practices.

Subclass IIe.—Nearly level soils, subject to erosion if not protected.

Unit IIe-1.—Moderately well drained, nearly level soils that have a sandy loam surface soil and a sandy loam to silty clay loam subsoil that contains a panlike layer.

Unit IIe-2.—Somewhat poorly drained to moderately well drained, level to nearly level soils that have a clay to sandy clay subsoil.

Unit IIe-3.—Well-drained, nearly level soils that have a sandy loam surface soil and a friable sandy clay loam subsoil.

Subclass IIw.—Soils moderately limited by wetness but easily drained for cropland.

Unit IIw-1.—Somewhat poorly drained, level to nearly level soils that have a panlike layer in the subsoil.

Class III.—Soils that have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Subclass IIIe.—Sloping soils, subject to erosion if not protected.

Unit IIIe-1.—Well-drained, gently sloping soils that have a sandy loam surface soil and a friable sandy clay loam subsoil.

Unit IIIe-2.—Moderately well drained, nearly level and gently sloping soils that have a sandy loam surface soil and a sandy loam to sandy clay loam subsoil that contains a panlike layer.

Unit IIIe-3.—Somewhat poorly drained to moderately well drained, nearly level to gently sloping soils that have a clay to sandy clay subsoil.

Subclass IIIw.—Poorly drained, level soils that can be improved by drainage.

Unit IIIw-1.—Poorly drained, level soils that have a silt loam to clay subsoil.

Unit IIIw-2.—Somewhat poorly drained, level to nearly level, moundy soils that have a panlike layer in the subsoil.

Class IV.—Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe.—Gently sloping, severely eroded soils, or sloping soils that are uneroded to eroded.

Unit IVe-1.—Well-drained, slightly to severely eroded, gently sloping to sloping soils that have a sandy clay to sandy clay loam subsoil.

Unit IVe-2.—Moderately well drained, eroded, gently sloping to sloping soils that have a silty clay loam to sandy clay loam subsoil that contains a panlike layer.

Unit IVe-3.—Somewhat poorly drained to moderately well drained, eroded, gently sloping to sloping soils that have a clay to sandy clay subsoil.

Class V.—Soils that have little or no erosion hazard, but have other limitations impractical to remove that limit their use largely to pasture, range, woodland, or wildlife food and cover.

Subclass Vw.—Poorly drained bottom-land soils that are frequently flooded.

Unit Vw-1.—Poorly drained, level bottom-land soils that are frequently flooded.

Class VI.—Soils that have severe limitations that make them generally unsuitable for cultivation, and limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass VIe.—Severely eroded, gently sloping soils, or eroded, moderately steep soils.

Unit VIe-1.—Well-drained, eroded, gently sloping to moderately steep soils that have a sandy clay to sandy clay loam subsoil.

Unit VIe-2.—Somewhat poorly drained, eroded, moderately steep soils that have a sandy clay loam to sandy clay subsoil.

Class VII.—Soils that have very severe limitations that make them unsuitable for cultivation and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIe.—Sloping to steep, severely eroded soils.

Unit VIIe-1.—Well-drained, sloping to moderately steep, severely eroded soils that have a sandy clay to sandy clay loam subsoil.

Unit VIIe-2.—Somewhat poorly drained, moderately steep to steep, eroded soils that have a clay subsoil.

Subclass VIIs.—Nearly level, droughty, alkaline soils.

Unit VIIs-1.—Poorly drained, level terrace soils that have a heavy clay, alkaline subsoil.

Capability unit I–1

The soils in this unit are level and well drained. They lie on first bottoms and are subject to overflow in winter and spring. The surface soil, a silt loam or fine sandy loam, is 10 to 15 inches thick. The subsoil is sandy loam to silty clay loam.

The soils in this unit are—

Iuka-Mantachie silt loams.
Ochlockonee fine sandy loam.

These soils contain a large amount of organic matter. They are medium acid to strongly acid. Runoff is medium, permeability is rapid, and the available moisture holding capacity is high. Productivity is high, and tilth is good.

These are among the most desirable soils in the county for crops and pasture. About 80 percent of the acreage is in woodland, about 15 percent is in pasture, and the rest is cultivated. Pin oak, maple, hickory, and cherrybark oak are the best suited hardwood species. The most suitable pasture plants are bermudagrass, dallisgrass, whiteclover, and lespedeza. Cotton, corn, peas, and small grains are well suited.

Rotations that include row crops should consist of legumes for at least one-third of the time. One possible rotation is 1 year of corn alternated with 1 year of corn interplanted with peas. Another good rotation is 1 year of corn and 2 years of lespedeza.

When these soils are cultivated, they require row direction to take care of excess water in spring. In some places, ditches are needed to divert water from cultivated fields.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit I–2

The soils in this unit are level and moderately well drained. The surface soil is very fine sandy loam that is 8 to 12 inches thick. The subsoil is sandy loam to silty clay loam, and it contains a panlike layer.

The soils in this unit are—

Prentiss very fine sandy loam, level phase.
Savannah very fine sandy loam, level phase.

These soils contain a small to medium amount of organic matter. They are medium acid to strongly acid. Runoff is slow to medium, permeability is moderate, and the available moisture holding capacity is moderate. The productivity is low to medium. The surface soil has good tilth. The hazard of erosion is very slight.

About 60 percent of the area of these soils is in woodland, 30 percent is cultivated, and 10 percent is in pasture. All crops commonly grown in the county are well suited to these soils. The trees best suited are loblolly pine, shortleaf pine, red oak, white oak, post oak, sweetgum, and blackgum. Pasture plants that are well suited are bermudagrass, dallisgrass, bahiagrass, lespedeza, and whiteclover. Cotton, corn, vegetables, tomatoes, peas, vetch, Austrian winter peas, and small grains are well suited.

Where row crops are grown, legumes should cover the soil for at least one-third of the time. One year of corn interplanted with peas can be alternated with 1 year of corn alone. Another possible rotation is 1 year of small grain and 1 year of cotton followed by a winter cover crop of legumes.

Cultivated fields may require row direction to take care of excess water in the spring. Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit IIe–1

The soils in this unit are nearly level and moderately well drained. The surface soil is sandy loam that is 8 to 12 inches thick. The subsoil is sandy loam to silty clay loam. It contains a panlike layer.

The soils in this unit are—

Prentiss very fine sandy loam, nearly level phase.
Prentiss very fine sandy loam, eroded nearly level phase.
Savannah very fine sandy loam, nearly level phase.
Savannah very fine sandy loam, eroded nearly level phase.

These soils contain a small to medium amount of organic matter. They are medium acid to strongly acid. Runoff is medium, permeability is moderate, and the available moisture holding capacity is moderate. The productivity is low to medium. Tilth is good. There is a slight hazard of erosion.

All of the common crops in the county are well suited to these soils. About 80 percent of the acreage is used for woodland, 10 percent for pasture, and 10 percent for cultivated crops. The best suited trees are loblolly pine, shortleaf pine, red oak, white oak, post oak, sweetgum, and blackgum. Pasture plants that are well suited are bermudagrass, dallisgrass, bahiagrass, lespedeza, and whiteclover (fig. 3). Cotton, corn, vegetables, tomatoes, peas, vetch, Austrian winter peas, and small grains are all well suited.

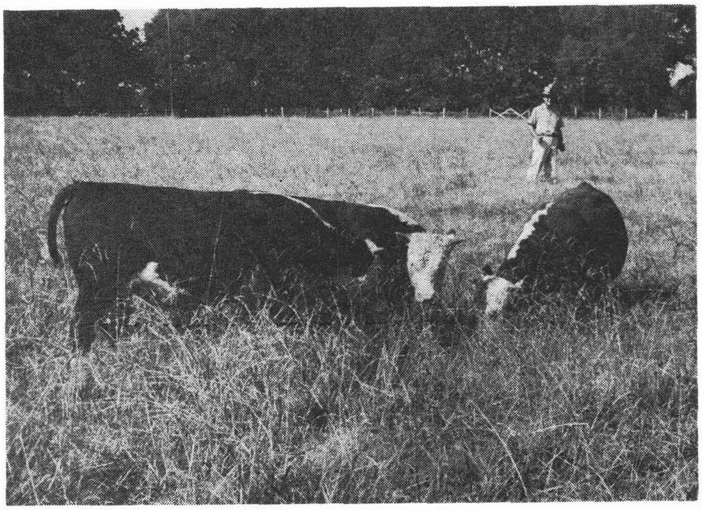

Figure 3.—**Pasture of bermudagrass and dallisgrass on Savannah very fine sandy loam, nearly level phase.**

Where clean-tilled crops are grown, the soil should be covered by legumes at least one-third of the time. One suitable rotation is 1 year of cotton followed by a winter cover crop of legumes; 1 year of corn; and 1 year of cotton. Another is 1 year of a small grain; 1 year of cotton

followed by a winter cover crop of legumes; and 1 year of corn.

If these soils are cultivated, they require terracing. Rows should run parallel to the terraces. Water should be drained into vegetated waterways, woodland, or sodded pasture.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit IIe-2

The soils in this unit are level to nearly level and somewhat poorly drained to moderately well drained. Their subsoil is clay to sandy clay. The texture of the surface soil is fine sandy loam. The surface soil is 6 to 10 inches thick.

The soils in this unit are—

Boswell very fine sandy loam, nearly level phase.
Boswell gravelly fine sandy loam, nearly level phase.
Sawyer very fine sandy loam, level phase.
Sawyer very fine sandy loam, nearly level phase.
Shubuta fine sandy loam, eroded nearly level phase.

These soils are medium acid to strongly acid. Runoff is medium to rapid. Permeability ranges from very slow to moderate. The capacity for holding available moisture is moderate. Productivity is low to medium. Tilth is poor to fair. The soils are susceptible to erosion.

More than 90 percent of the acreage is in woodland; the remainder is pastured or used for cultivated crops. The trees best suited to these soils are loblolly pine, shortleaf pine, red oak, white oak, post oak, sweetgum, and blackgum. Bermudagrass, dallisgrass, bahiagrass, lespedeza, and whiteclover are fairly well suited pasture plants. Cotton, corn, vetch, peas, Austrian winter peas, and small grains are also fairly well suited. Yields of vegetables and tomatoes are uncertain.

Row crops should not be grown on these soils oftener than once in 2 years. A winter legume or a summer legume should be grown on half of the acreage each year. If a clean-tilled crop is grown every year, it is best to change the row crop each year. Summer legumes, such as peas, should be interplanted with corn.

These soils should be terraced when they are used for cultivated crops. Crop rows should be parallel to the terraces. Water should be drained into vegetated waterways, woodland, or sodded pasture.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit IIe-3

The soils in this unit are well drained and nearly level. The sandy loam surface soil ranges from 8 to 20 inches in thickness. The friable subsoil is sandy clay loam.

The soils in this unit are—

Cahaba sandy loam, nearly level phase.
Kalmia fine sandy loam, nearly level low terrace phase.
Ruston fine sandy loam, nearly level phase.

These soils are medium acid to strongly acid. Runoff is medium, and permeability is moderate. The available moisture holding capacity is moderate. Productivity ranges from average to above the average for the county. Tilth is good. The erosion hazard is slight.

About 90 percent of the acreage is cultivated; the rest is in pasture or woodland. Loblolly pine, shortleaf pine, red oak, white oak, and post oak are suitable woodland species. Bermudagrass, dallisgrass, annual lespedeza, sericea lespedeza, and whiteclover are well-suited pasture plants. Early crops, such as tomatoes, beans, peas, watermelons, and potatoes, are well suited. Other crops that yield well when grown on these soils are cotton, corn, peanuts, oats, barley, wheat, and rye.

Where row crops are grown, legumes should cover the soil for at least one-third of the time. If clean-tilled crops are grown continuously, change the row crop each year. One suitable rotation is 1 year of tomatoes followed by a winter cover crop of legumes; 1 year of corn; and 1 year of cotton. Another is 1 year of cotton followed by a winter cover crop of legumes; 1 year of corn; and 1 year of cotton.

Cultivation should be on the contour. Terraces may be needed on slopes of 3 percent. Crop rows should be parallel to the terraces. Excess water should be drained into vegetated waterways or into woodland or pasture.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit IIw-1

The soils in this unit are somewhat poorly drained. They are level to nearly level. The surface soil is silt loam or very fine sandy loam and is from 6 to 10 inches thick. The subsoil is silt to sandy clay loam and contains a hardened, panlike layer.

The soils in this unit are—

Pheba and Lewiston soils, level phases.
Pheba and Lewiston soils, nearly level phases.
Pheba and Lewiston soils, eroded nearly level phases.
Stough very fine sandy loam, level phase.
Stough very fine sandy loam, nearly level phase.

These soils contain little organic matter. They are medium acid to strongly acid. Runoff is slow to medium, permeability is slow to moderate, and the available moisture holding capacity is moderate. Productivity is low. Tilth is poor to fair. The erosion hazard is slight.

More than 90 percent of the acreage is in woodland. Loblolly pine, shortleaf pine, red oak, white oak, post oak, and pin oak are well suited. Well-suited pasture plants are bermudagrass, carpetgrass, dallisgrass, bahiagrass, lespedeza, and whiteclover. Cotton, corn, peas, vetch, Austrian winter peas, and small grains are fairly well suited, but yields of vegetables and tomatoes are uncertain.

Row crops should not be grown on these soils more than 2 years out of 3. At least once every 3 years, a summer legume crop should be turned under or left on the soil. If clean-tilled crops are grown every year, plant a different row crop each year. A summer legume, such as peas, should be interplanted with corn. A winter cover crop of legumes should be grown at least 1 year out of 3.

Most of these soils need surface drainage if they are used for row crops, and they also need row direction. These practices help remove water in the spring and may allow planting from 2 to 3 weeks earlier.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen

for all nonlegumes. Some pasture plants respond to lime. A sod crop in the rotation will increase the supply of organic matter.

Capability unit IIIe-1

The soils in this unit are gently sloping and well drained. The surface soil is sandy loam or fine sandy loam that is 6 to 12 inches thick. The subsoil is friable sandy clay loam. The Saffell soils contain many pieces of chert and quartz gravel less than 1 inch in diameter.

The soils in this unit are—

Cahaba sandy loam, gently sloping phase.
Cahaba sandy loam, eroded gently sloping phase.
Kalmia fine sandy loam, gently sloping low terrace phase.
Orangeburg fine sandy loam, gently sloping phase.
Orangeburg fine sandy loam, eroded gently sloping phase.
Ruston fine sandy loam, gently sloping phase.
Ruston fine sandy loam, eroded gently sloping phase.
Saffell gravelly fine sandy loam, gently sloping phase.
Saffell gravelly fine sandy loam, eroded gently sloping phase.

These soils are medium acid to strongly acid. Runoff is medium, and permeability is moderate to rapid. The available moisture holding capacity is moderate. The productivity ranges from average to above average for the county. Tilth is good. The soils are susceptible to erosion.

More than 50 percent of the acreage is cultivated. The rest is in pasture or woodland. Trees that are well suited are loblolly pine, shortleaf pine, red oak, white oak, and post oak. Bermudagrass, dallisgrass, annual lespedeza, sericea lespedeza, and whiteclover are well-suited pasture plants. Early crops, such as tomatoes, beans, peas, watermelons, and potatoes, are well suited to these soils. Other crops that produce good yields are cotton, corn, peanuts, vetch, and small grains.

Where row crops are grown, legumes should cover the soil 1 year out of 3. If a clean-tilled crop is grown every year, change the row crop each year. One suitable rotation is 1 year of tomatoes followed by a winter cover crop of legumes; 1 year of corn; and 1 year of cotton. Another is 1 year of cotton followed by a winter cover crop of legumes; 1 year of corn; and 1 year of cotton.

If these soils are cultivated, they should be terraced (fig. 4). Rows should be parallel to the terraces. Excess water should be diverted into vegetated waterways, woodland, or sodded pasture.

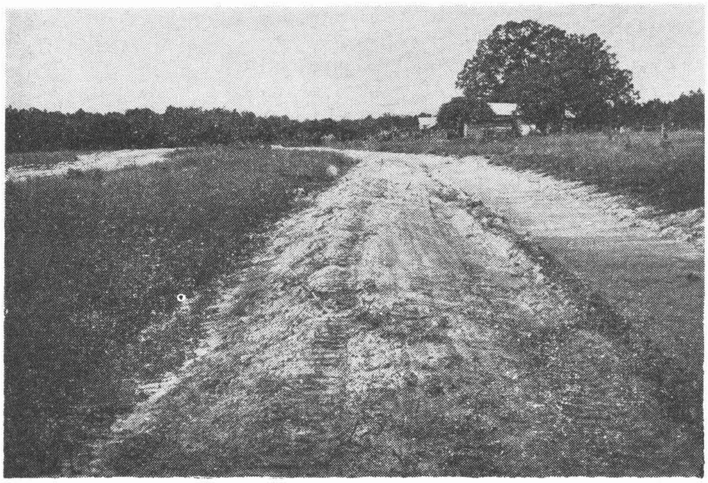

***Figure 4.*—Construction of terrace system with bulldozer on gently sloping Ruston and Savannah soils.**

542653—61——2

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit IIIe-2

The soils in this unit are nearly level to gently sloping. They are moderately well drained. The surface soil is very fine sandy loam from 6 to 12 inches thick. The subsoil is sandy loam to silty clay loam, and it contains a panlike layer.

The soils in this unit are—

Prentiss very fine sandy loam, gently sloping phase.
Prentiss very fine sandy loam, eroded gently sloping phase.
Prentiss very fine sandy loam, mound phase.
Prentiss very fine sandy loam, eroded mound phase.
Savannah very fine sandy loam, gently sloping phase.
Savannah very fine sandy loam, eroded gently sloping phase.

These soils are medium acid to strongly acid. Runoff is medium, permeability is moderate, and the available moisture holding capacity is moderate. Productivity is average for this county. Tilth is good. These soils are susceptible to erosion.

About 60 percent of the acreage is in woodland, 30 percent is cultivated, and 10 percent is in pasture. All crops grown in the county are well suited to these soils. The trees best suited are loblolly pine, shortleaf pine, red oak, white oak, post oak, sweetgum, and blackgum. Pasture plants that are well suited are bermudagrass, dallisgrass, bahiagrass, lespedeza, and whiteclover. Cotton, corn, vegetables, tomatoes, peas, vetch, Austrian winter peas, and small grains are well suited.

If clean-tilled crops are grown, the soil should be in legumes for one-third of the time. One suitable rotation is 1 year of cotton followed by a winter cover crop of legumes; 1 year of corn; and 1 year of cotton. Another is 1 year of small grain; 1 year of cotton followed by a winter cover crop of legumes; and 1 year of corn.

If these soils are used for cultivated crops, they require terracing. The rows should be parallel to the terraces. Excess water should be drained into vegetated waterways, woodland, or sodded pasture.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit IIIe-3

The soils in this unit are nearly level to gently sloping and somewhat poorly drained to moderately well drained. The Wilcox soil has a surface soil of silty clay loam from 4 to 8 inches thick. The other soils have a fine sandy loam or very fine sandy loam surface soil that is 6 to 10 inches thick. Two of the Boswell soils contain pieces of chert and quartz gravel up to 1 inch in diameter. All the soils have a clay to sandy clay subsoil.

The soils in this unit are—

Boswell very fine sandy loam, eroded nearly level phase.
Boswell very fine sandy loam, gently sloping phase.
Boswell very fine sandy loam, eroded gently sloping phase.
Boswell gravelly fine sandy loam, gently sloping phase.
Boswell gravelly fine sandy loam, eroded gently sloping phase.
Sawyer very fine sandy loam, eroded nearly level phase.
Sawyer very fine sandy loam, gently sloping phase.

Sawyer very fine sandy loam, eroded gently sloping phase.
Shubuta fine sandy loam, eroded gently sloping phase.
Wilcox silty clay loam, nearly level phase.

These soils have little organic matter. They are medium acid to strongly acid. Runoff is medium to rapid, and permeability ranges from very slow to moderate. The available moisture holding capacity is moderate. The productivity is low. Tilth is poor to only fair. These soils are very susceptible to erosion.

More than 90 percent of the acreage is in woodland. Loblolly pine, shortleaf pine, red oak, white oak, and post oak are well suited to these soils. Bermudagrass, dallisgrass, bahiagrass, lespedeza, and whiteclover are fairly well suited. Cotton, corn, Austrian winter peas, and small grains are also fairly well suited, but yields of tomatoes are uncertain.

Row crops should not be grown on these soils for more than 1 year out of every 2. A summer legume crop should be turned under or left on the soil at least every other year. If a clean-tilled crop is grown every year, change the row crop every year. Summer legumes, such as peas, should be interplanted with corn. A winter cover crop of legumes should be grown at least every other year.

If these soils are cultivated, they need terracing. Rows should be parallel to the terraces. Runoff water should be guided into vegetated waterways, woodland, or sodded pasture.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime. Including a sod crop in the rotation will increase the supply of organic matter.

Capability unit IIIw-1

The soils in this unit are level and poorly drained. The surface soil is silty clay loam or very fine sandy loam from 4 to 10 inches thick. The subsoil is silt loam to clay.

The soils in this unit are—

Caddo and Tickfaw silt loams.
Leaf silt loam.
Myatt silt loam.
Myatt-Kalmia complex, mound phase.
Wilcox silty clay loam, level phase.

These soils contain little organic matter. They are medium acid to strongly acid. Runoff is slow, permeability is slow to very slow, and the available moisture holding capacity is low to moderate. Productivity is low. Tilth is poor.

More than 95 percent of the acreage is in woodland. Loblolly pine, red oak, water oak, soft maple, hickory, and ash are well suited. The best suited crops are pasture plants, such as bermudagrass, dallisgrass, bahiagrass, lespedeza, and whiteclover. Without drainage, success with row crops is uncertain on these soils. With drainage, cotton, corn, small grains, and Austrian winter peas are fairly well suited.

If clean-tilled crops are planted, legumes should be grown on the soil 1 year out of 3. One suitable rotation is 1 year of cotton followed by Austrian winter peas; 1 year of cotton; and 1 year of small grain. Another is 1 year of small grain and 1 year of cotton followed by a winter cover crop of legumes.

These soils cannot be cultivated and planted until late in the season. They need drainage before they can be used for crops.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit IIIw-2

The soils in this unit are generally level to nearly level, but mounds of various sizes are scattered over the surface. Drainage is somewhat poor. The surface soil is mostly very fine sandy loam but includes small areas of fine sandy loam. It is from 6 to 10 inches thick. The subsoil is silt to sandy clay loam. The subsoil contains a panlike layer, which lies at the same level under the mounds and between them.

The only mapping unit in this capability unit is—

Stough-Kalmia complex, mound phase.

These soils have little organic matter. They are medium to strongly acid. Runoff is slow to medium. Permeability is slow to moderate. The available moisture holding capacity is moderate. Productivity is low. Tilth is poor to fair. These soils are susceptible to erosion.

More than 90 percent of the acreage is in woodland. Loblolly pine, shortleaf pine, red oak, white oak, post oak, and pin oak are well suited. Bermudagrass, carpetgrass, dallisgrass, bahiagrass, lespedeza, and whiteclover are well-suited pasture plants. Cotton, corn, peas, vetch, Austrian winter peas, and small grains are fairly well suited, but yields of vegetables and tomatoes are uncertain.

Row crops should not be grown on these soils for more than 2 years out of 3. At least once in every 3 years, a summer legume crop should be turned under or left on the soil. If a clean-tilled crop is grown every year, change the row crop each year. A summer legume, such as peas, can be interplanted with corn. A winter cover crop of legumes should be grown at least 1 year out of 3.

Planting and cultivating of row crops will be delayed by poor drainage, unless surface drainage is provided. Row direction is necessary on the level soils. The nearly level soils may require terracing. Rows should be parallel to the terraces, and the water should be diverted into vegetated waterways or toward woodland or sodded pasture. Mounds are a problem in terracing.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit IVe-1

The soils in this unit are gently sloping to sloping and well drained. They are slightly eroded to severely eroded. Some have a fine sandy loam surface soil 6 to 12 inches thick. The Ruston soil has a surface soil of sandy clay loam 1 to 5 inches thick. The surface soil of the Saffell soils contains many pieces of chert and quartz gravel less than 1 inch in diameter. In all the soils, the subsoil ranges from sandy clay to sandy clay loam.

The soils in this unit are—

Cahaba sandy loam, sloping phase.
Orangeburg fine sandy loam, sloping phase.
Ruston sandy clay loam, severely eroded gently sloping phase.
Ruston fine sandy loam, sloping phase.
Saffell gravelly fine sandy loam, sloping phase.
Saffell gravelly fine sandy loam, eroded sloping phase.

There is little organic matter in these soils. The reaction is medium acid to strongly acid. Runoff is medium, permeability is moderate to rapid, and the available moisture holding capacity is moderate. Productivity is moderate to low. The surface soil has good tilth and is very susceptible to erosion.

About 85 percent of the acreage is in woodland. Trees that are well suited are loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum. Bermudagrass, dallisgrass, sericea lespedeza, and whiteclover are well-suited pasture plants. Small grains, peas, soybeans, and vetch are well-suited crops.

These soils should have a permanent cover of grasses and deep-rooted legumes. Row crops should not be grown oftener than once in 4 years, and then only to reestablish the grasses and legumes. Mixtures of legumes and small grains can be grown. In some areas, terraces and gully control measures will be needed before legumes can be established (fig. 5).

***Figure 5.*—Deep gully in Saffell gravelly fine sandy loam, eroded sloping phase, caused by lack of proper outlet for terrace draining into roadside ditch. The field contains sericea lespedeza.**

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit IVe–2

The soils in this unit are moderately well drained and gently sloping to sloping. They are eroded. The surface soil is very fine sandy loam from 6 to 10 inches thick. The subsoil is sandy loam to silty clay loam. It contains a panlike layer.

The soils in this unit are—

Prentiss very fine sandy loam, sloping phase.
Savannah very fine sandy loam, sloping phase.

These soils contain little organic matter. They are medium acid to strongly acid. Runoff is medium to rapid. Permeability is moderate, and the available moisture holding capacity is moderate. Productivity is low. The surface soil has fair to good tilth and is susceptible to further erosion.

More than 90 percent of the acreage is in woodland. Loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum are well suited. Bermudagrass, dallisgrass, lespedeza, and whiteclover are suitable pasture plants. Crops well suited to these soils are small grains, peas, soybeans, and vetch.

Row crops should not be grown on these soils oftener than once in every 4 years. A permanent cover of grass and legumes is needed. Some areas require terracing and gully control before a permanent cover of deep-rooted legumes or a mixture of legumes and small grains can be established.

Most cultivated crops and pasture plants other than legumes respond to nitrogen, phosphorus, and potassium. Most pasture plants respond to lime.

Capability unit IVe–3

The soils in this unit are somewhat poorly drained to moderately well drained. They are eroded. The slopes are gentle to moderate. The Wilcox soils have a silty clay loam surface soil 2 to 8 inches thick. The Boswell soil has a sandy clay surface soil 1 to 5 inches thick. The subsoil is clay to sandy clay.

The soils in this unit are—

Boswell sandy clay, severely eroded gently sloping phase.
Wilcox silty clay loam, gently sloping phase.
Wilcox silty clay loam, eroded gently sloping phase.

These soils are medium acid to strongly acid. Runoff is rapid, permeability is very slow, and the available moisture holding capacity is moderate. Productivity is low. Tilth is poor. All of these soils are very susceptible to erosion.

More than 95 percent of the acreage is in woodland. Loblolly pine, shortleaf pine, red oak, white oak, post oak, sweetgum, and blackgum are well suited. Bermudagrass, dallisgrass, lespedeza, and whiteclover are fairly well suited. Small grains, peas, soybeans, and vetch are also fairly well suited.

These soils need a permanent cover of grasses or deep-rooted legumes. Row crops should not be grown oftener than once in every 4 years. In some areas, terracing and gully control will be needed before a cover of legumes or a mixture of legumes and small grains can be established.

Phosphorus and potassium are required for high yields of most cultivated crops and pasture plants, and nitrogen for all nonlegumes. Some pasture plants respond to lime.

Capability unit Vw–1

The soils in this unit lie on level bottom lands that are subject to frequent overflow. They are poorly drained. The surface soil is silt loam or silty clay that varies considerably in thickness. The subsoil ranges from silt to clay.

The soils in this unit are—

Bibb silt loam.
Chastain silty clay.
Mixed alluvial land.

The content of organic matter ranges from small to large. Water stands on the surface of these soils for long periods, especially in fall and spring. The permeability is slow to moderate. The available moisture holding capacity is moderate to high. Productivity is low.

More than 98 percent of the acreage is in woodland. Well-suited species of trees are sweetgum, blackgum, beech, cypress, water oak, white oak, red oak, maple, and ironwood. Pasture plants that are suited are bermudagrass, carpetgrass, dallisgrass, and lespedeza. Cultivated crops are not suited to these soils because of the frequency of overflow.

Capability unit VIe–1

The soils in this unit are well drained and gently sloping to moderately steep. They are eroded. The surface soil is fine sandy loam 6 to 12 inches thick. The subsoil ranges from sandy clay loam to sandy clay. The Saffell soil contains many small pieces of chert and quartz gravel less than 1 inch in diameter.

The soils in this unit are—

Orangeburg and Ruston fine sandy loams, moderately steep phases.
Saffell gravelly fine sandy loam, severely eroded gently sloping phase.

These soils contain little organic matter. They are medium acid to strongly acid. Runoff is medium to rapid, and permeability is moderate to rapid. The available moisture holding capacity is moderate. Productivity is low to moderate. The surface soils have good tilth. They are very suspectible to erosion.

More than 90 percent of the acreage is in woodland. Loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum are well suited. The pasture plants best suited are bermudagrass, dallisgrass, sericea lespedeza, and whiteclover. Cultivated crops are not suited to these soils.

Some areas that are used for pasture need gully control practices. They should occasionally be reseeded to suitable pasture plants. Legumes should be grown, and fertilizer and lime should be applied.

Capability unit VIe–2

The soils in this unit are somewhat poorly drained and moderately steep. They are eroded. The surface soil is very fine sandy loam or fine sandy loam, 4 to 8 inches thick. The Shubuta soil contains sandstone and ironstone gravel less than 1 inch in diameter. The subsoil is sandy clay loam to sandy clay.

The soils in this unit are—

Sawyer very fine sandy loam, moderately steep phase.
Shubuta gravelly fine sandy loam, moderately steep phase.

There is little organic matter in these soils. The reaction is medium acid to very strongly acid. Runoff is very rapid, and permeability is slow. The available moisture holding capacity is moderate. Productivity is low. The surface soil has fair to good tilth and is very susceptible to erosion.

More than 95 percent of the acreage is in woodland. Well-suited trees are loblolly pine, shortleaf pine, red oak, white oak, sweetgum, and blackgum. Bermudagrass, dallisgrass, bahiagrass, lespedeza, and whiteclover are fairly well suited pasture plants.

Areas used for pasture require occasional reseeding with suitable pasture plants. In some areas, practices to control gully erosion are needed. Legumes should be grown. Fertilizer and lime are needed.

Capability unit VIIe–1

The soils in this unit are severely eroded. They are well drained and sloping to moderately steep. The Saffel soil has a surface soil of gravelly fine sandy loam that is 5 to 8 inches thick and contains many pieces of chert and quartz gravel less than 1 inch in diameter. The surface soil of Gullied land ranges from sandy clay loam to clay, and it is less than 5 inches thick. The subsoil ranges from sandy clay loam to sandy clay.

One soil and one land type are in this unit—

Gullied land.
Saffell gravelly fine sandy loam, 12 to 25 percent slopes.

The supply of organic matter is small. The reaction is medium acid to strongly acid. Runoff is medium to rapid, and permeability is moderate to rapid. The available moisture holding capacity is moderate. Productivity is low. Tilth is fair. These soils are very susceptible to erosion.

More than 90 percent of the acreage is in woodland. Well-suited trees are loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum. The best suited pasture plants are bermudagrass, dallisgrass, sericea lespedeza, and whiteclover.

Some areas used for pasture require special practices to control gullies. Pastures should be reseeded occasionally. Legumes should be grown. Fertilizer and lime are needed.

Capability unit VIIe–2

The soils in this unit are moderately steep to steep. They are somewhat poorly drained. They are eroded. The Wilcox soils have a silty clay loam surface soil that is 2 to 8 inches thick. The Boswell soil has a surface soil of fine sandy loam or very fine sandy loam from 4 to 8 inches thick. The subsoil is clay.

The soils in this unit are—

Boswell very fine sandy loam, 8 to 20 percent slopes.
Wilcox silty clay loam, moderately steep phase.
Wilcox silty clay loam, steep phase.

There is little organic matter in these soils. The reaction is medium acid to strongly acid. Runoff is very rapid, and permeability is very slow. The available moisture holding capacity is moderate. Productivity is low. The surface soil has poor tilth and is very susceptible to erosion.

More than 95 percent of the acreage is in woodland. Well-suited trees are loblolly pine, shortleaf pine, red oak, white oak, post oak, sweetgum, and blackgum.

Capability unit VIIs-1

The soil in this unit is poorly drained. It lies on level terraces. The surface soil ranges from silt to very fine sandy loam and is from 1 to 8 inches thick. The alkaline subsoil is silty clay to clay.

The only soil in this unit is—

Lafe very fine sandy loam.

This soil is slightly acid to alkaline at the surface. Runoff is very slow, and permeability is very slow. Productivity is very low.

Less than 10 percent of this soil supports trees. A few small mounds scattered over the area support a few stunted post oaks and loblolly pines. The greater part of the soil has a sparse cover of three-awn grass and annual lespedeza. The native vegetation is of little value.

Estimated Yields

Table 1 shows, for each soil in the county, the average yields per acre of the principal crops that can be expected over a period of years, under common management and under improved management.

The figures in columns "A" are estimates of yields to be expected under common management practices. Under this level of management, crops are not rotated according to any definite plan, no soil tests are made to determine the amount and kind of commercial fertilizer needed, and little care is taken to prevent erosion.

The figures in columns "B" are estimates of the yields obtained by using the best system of management now available to increase production. Under this level of management, crops are chosen carefully and grown in a good rotation; soils are fertilized according to needs indicated by tests; organic matter is returned to the soil; tillage is properly timed; and erosion is controlled by mechanical means where necessary.

The estimates in table 1 are based primarily on records kept by 25 farmers over a period of 3 to 5 years. The estimates were verified by other agricultural workers who observed soils and crop yields in the county.

These yield figures may not apply directly to specific fields for any particular year, because the soils vary somewhat from place to place, management practices differ slightly from farm to farm, and weather conditions vary from year to year. The estimates are intended only as a general guide to the relative productivity of the soils and an indication of how the soils respond to improvements in management.

Use of Soils for Growing Wood Crops[1]

Bradley County was originally covered almost entirely by forest. Pines and hardwoods grew on the uplands and terraces, and hardwoods grew on the bottom lands. Cutting of the timber began about 1900 and continued until about 1925. Most of the cutting was for lumber, but a considerable amount was done to clear land for agriculture.

[1] JAMES T. BEENE, woodland conservationist, SCS, assisted in the preparation of this section.

About 85 percent of the land area of the county is now in woodland. Industries that use wood own about 81 percent of this woodland, and farmers and other individuals own about 19 percent.

Forest Cover Types

There are three major cover types of forest in Bradley County: (1) Loblolly pine-shortleaf pine, (2) sweetgum-Nuttall oak-willow oak, and (3) loblolly pine-hardwood (*7*).[2] The type of natural forest that develops depends mainly on the drainage.

In general, areas of the three major types coincide with the general soil areas (see fig. 2, p. 2).

Loblolly pine-shortleaf pine

This cover type predominates on both the Savannah-Ruston-Saffell general soil area and the Wilcox-Boswell general soil area.

Other forest cover types associated with the loblolly pine-shortleaf pine type in the Savannah-Ruston-Saffell area are shortleaf pine, shortleaf pine-oak, loblolly pine, and swamp chestnut oak-cherrybark oak. This area occupies uplands in the Forested Coastal Plain. The soils are sandy loam, very fine sandy loam, and gravelly fine sandy loam. On Saffell gravelly fine sandy loam, the site index for loblolly pine is 80 and the site index for shortleaf pine is 71. On Savannah very fine sandy loam, the site index for loblolly pine is 79 and that for shortleaf pine is 76.

The forest cover types that are associated with the loblolly pine-shortleaf pine type in the Wilcox-Boswell general soil area are shortleaf pine-oak, loblolly pine, loblolly pine-hardwood, and sweetgum-Nuttall oak-willow oak. This general soil area consists of very fine sandy loam, silty clay, and clay loam. It occupies uplands in the Forested Coastal Plain. On Boswell gravelly fine sandy loam, the site index for loblolly pine is 75 and that for shortleaf pine is 68. On Wilcox silty clay loam, the site index for loblolly pine is 82 and that for shortleaf pine is 71.

Sweetgum-Nuttall oak-willow oak

This forest cover type predominates in the Bibb-Ochlockonee-Chastain general soil area. Other forest cover types in the same area are the swamp chestnut oak-cherrybark oak type and the sugarberry (hackberry)-American elm-green ash type. This area occupies bottom land in the Forested Coastal Plain. The soils are silt loam to fine sandy loam. On Bibb silt loam, the average site index for loblolly pine is 89; on Ochlockonee fine sandy loam, it is 96. The site index for loblolly pine on Chastain silty clay could not be measured because the soil is too fine textured to produce measurable stands. Measurable stands of shortleaf pine were not found in quantity on any of the soils of the bottom lands, but loblolly pine normally grows on the best, most mature soils of the higher bottom-land ridges, in the swamp chestnut oak-cherrybark oak forest.

[2] Italic numbers in parentheses refer to Literature Cited, p. 65.

TABLE 1.—*Average acre yields of principal crops*

[Yields in columns A are those to be expected over a period of years under common management; those in columns B are those to be expected over a period of years under improved management. Where no yield figure is given, the soil is generally considered unsuitable for that crop]

Mapping unit	Capability unit	Corn (in ear)		Cotton (lint)		Oats		Tomatoes		Lespedeza		Pasture	
		A	B	A	B	A	B	A	B	A	B	A	B
		Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Bibb silt loam	Vw-1									1.0	1.5	75	100
Boswell very fine sandy loam, nearly level phase	IIe-2	20	40	300	500	23	50	75	150	.9	1.75	70	90
Boswell very fine sandy loam, eroded nearly level phase	IIIe-3	16	28	220	400	16	38			.7	1.4	70	90
Boswell very fine sandy loam, gently sloping phase	IIIe-3	15	26	220	400	16	38			.7	1.4	70	90
Boswell very fine sandy loam, eroded gently sloping phase	IIIe-3	14	25	210	385	15	35			.7	1.4	70	90
Boswell sandy clay, severely eroded gently sloping phase	IVe-3					12	25			.5	.75	40	60
Boswell very fine sandy loam, 8 to 20 percent slopes	VIIe-2											20	40
Boswell gravelly fine sandy loam, nearly level phase	IIe-2	20	40	300	500	23	50	75	150	.9	1.75	70	90
Boswell gravelly fine sandy loam, gently sloping phase	IIIe-3	14	25	210	385	15	35			.7	1.4	70	90
Boswell gravelly fine sandy loam, eroded gently sloping phase	IIIe-3	12	24	200	375	15	35			.7	1.4	70	90
Caddo and Tickfaw silt loams	IIIw-1	8	15	150	250	14	30			.6	1.2	70	100
Cahaba sandy loam, nearly level phase	IIe-3	25	60	350	600	25	60	100	300	1.1	2.0	75	100
Cahaba sandy loam, gently sloping phase	IIIe-1	20	40	275	500	20	45	75	250	.8	1.5	75	100
Cahaba sandy loam, eroded gently sloping phase	IIIe-1	18	38	260	490	18	40	75	250	.8	1.5	75	100
Cahaba sandy loam, sloping phase	IVe-1					15	30			.7	1.0	50	75
Chastain silty clay	Vw-1									.8	1.0	70	95
Gullied land	VIIe-1											5	10
Iuka-Mantachie silt loams	I-1	28	55	360	720	25	60			1.3	2.3	80	125
Kalmia fine sandy loam, nearly level low terrace phase	IIe-3	20	40	300	500	25	60	90	275	1.0	2.0	75	100
Kalmia fine sandy loam, gently sloping low terrace phase	IIIe-1	18	38	260	490	18	40	75	250	.8	1.5	75	100
Lafe very fine sandy loam	VIIs-1											10	20
Leaf silt loam	IIIw-1	15	25	200	450	23	50			.9	1.75	70	90
Mixed alluvial land	Vw-1									1.0	1.5	75	115
Myatt silt loam	IIIw-1	8	15	100	200	10	20			.5	1.0	60	90
Myatt-Kalmia complex, mound phase	IIIw-1	8	15	100	200	10	20			.5	1.0	60	90
Ochlockonee fine sandy loam	I-1	30	60	375	750	25	60			1.3	2.3	80	125
Orangeburg fine sandy loam, gently sloping phase	IIIe-1	20	40	275	500	18	40	75	250	.8	1.5	70	90
Orangeburg fine sandy loam, eroded gently sloping phase	IIIe-1	18	38	260	490	18	40	75	250	.8	1.5	70	90
Orangeburg fine sandy loam, sloping phase	IVe-1					15	30			.7	1.0	50	70
Orangeburg and Ruston fine sandy loams, moderately steep phases	VIe-1											40	60
Pheba and Lewiston soils, level phases	IIw-1	18	38	200	450	23	50			1.0	1.5	70	100
Pheba and Lewiston soils, nearly level phases	IIw-1	20	40	200	450	23	50			1.0	1.5	70	100
Pheba and Lewiston soils, eroded nearly level phases	IIw-1	18	38	200	450	23	50			1.0	1.5	70	90
Prentiss very fine sandy loam, level phase	I-2	25	48	350	600	25	60	100	300	1.0	2.0	75	100
Prentiss very fine sandy loam, nearly level phase	IIe-1	23	45	350	600	25	60	100	300	1.0	2.0	75	100
Prentiss very fine sandy loam, eroded nearly level phase	IIe-1	20	40	325	575	20	50	100	300	1.0	2.0	70	100
Prentiss very fine sandy loam, gently sloping phase	IIIe-2	18	30	275	460	20	45	60	240	.8	1.5	75	100
Prentiss very fine sandy loam, eroded gently sloping phase	IIIe-2	16	28	260	450	20	40	60	230	.8	1.5	70	100
Prentiss very fine sandy loam, sloping phase	IVe-2					15	30			.7	1.0	50	75
Prentiss very fine sandy loam, mound phase	IIIe-2	18	30	275	460	20	45	60	240	.8	1.5	75	115

TABLE 1.—*Average acre yields of principal crops*—Continued

Mapping unit	Capability unit	Corn (in ear)		Cotton (lint)		Oats		Tomatoes		Lespedeza		Pasture	
		A	B	A	B	A	B	A	B	A	B	A	B
		Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Prentiss very fine sandy loam, eroded mound phase	IIIe-2	16	28	260	450	20	40	60	230	0. 8	1. 5	75	115
Ruston fine sandy loam, nearly level phase	IIe-3	20	40	300	500	23	50	100	300	. 9	1. 75	70	90
Ruston fine sandy loam, gently sloping phase	IIIe-1	20	40	275	500	18	40	75	250	. 8	1. 5	70	90
Ruston fine sandy loam, eroded gently sloping phase	IIIe-1	18	38	260	490	18	40	75	250	. 8	1. 5	70	90
Ruston sandy clay loam, severely eroded gently sloping phase	IVe-1					14	28			. 6	1. 0	50	70
Ruston fine sandy loam, sloping phase	IVe-1					14	28			. 6	1. 0	50	70
Saffell gravelly fine sandy loam, gently sloping phase	IIIe-1	16	35	260	440	18	40	60	225	. 8	1. 5	70	90
Saffell gravelly fine sandy loam, eroded gently sloping phase	IIIe-1	14	35	250	400	16	38	60	200	. 7	1. 4	70	85
Saffell gravelly fine sandy loam, severely eroded gently sloping phase	VIe-1											30	50
Saffell gravelly fine sandy loam, sloping phase	IVe-1					14	28			. 6	1. 0	50	70
Saffell gravelly fine sandy loam, eroded sloping phase	IVe-1					12	24			. 5	. 8	40	60
Saffell gravelly fine sandy loam, 12 to 25 percent slopes	VIIe-1											20	40
Savannah very fine sandy loam, level phase	I-2	23	45	350	600	25	60	100	300	1. 0	2. 0	75	100
Savannah very fine sandy loam, nearly level phase	IIe-1	23	45	350	600	25	60	100	300	1. 0	2. 0	75	100
Savannah very fine sandy loam, eroded nearly level phase	IIe-1	20	40	340	580	23	50	90	275	1. 0	2. 0	75	100
Savannah very fine sandy loam, gently sloping phase	IIIe-2	18	30	275	460	20	45	60	240	. 8	1. 5	75	115
Savannah very fine sandy loam, eroded gently sloping phase	IIIe-2	16	28	260	450	20	40	60	230	. 8	1. 5	75	110
Savannah very fine sandy loam, sloping phase	IVe-2					15	30			. 7	1. 0	50	75
Sawyer very fine sandy loam, level phase	IIe-2	20	40	300	500	25	60	75	150	1. 0	2. 0	70	90
Sawyer very fine sandy loam, nearly level phase	IIe-2	20	40	300	500	25	60	75	150	1. 0	2. 0	70	90
Sawyer very fine sandy loam, eroded nearly level phase	IIIe-3	16	28	230	400	16	38	40	150	. 7	1. 4	70	100
Sawyer very fine sandy loam, gently sloping phase	IIIe-3	16	28	230	400	16	38	40	150	. 7	1. 4	70	95
Sawyer very fine sandy loam, eroded gently sloping phase	IIIe-3	15	26	220	385	15	35	40	150	. 7	1. 4	70	90
Sawyer very fine sandy loam, moderately steep phase	VIe-2											20	40
Shubuta fine sandy loam, eroded nearly level phase	IIe-2	20	40	300	500	25	60	75	150	1. 0	2. 0	70	90
Shubuta fine sandy loam, eroded gently sloping phase	IIIe-3	15	26	220	385	15	38	40	150	. 7	1. 4	70	95
Shubuta gravelly fine sandy loam, moderately steep phase	VIe-2											20	40
Stough very fine sandy loam, level phase	IIw-1	18	38	200	450	23	50			1. 0	1. 5	70	100
Stough very fine sandy loam, nearly level phase	IIw-1	20	40	200	450	23	50			1. 0	1. 5	70	100
Stough-Kalmia complex, mound phase	IIIw-2	14	24	150	250	14	30			. 6	1. 2	70	100
Wilcox silty clay loam, level phase	IIIw-1	15	20	200	450	23	48			. 8	1. 6	60	90
Wilcox silty clay loam, nearly level phase	IIIe-3	12	20	200	320	15	38			. 7	1. 4	60	95
Wilcox silty clay loam, gently sloping phase	IVe-3					12	25			. 5	. 75	40	60
Wilcox silty clay loam, eroded gently sloping phase	IVe-3					10	20			. 5	. 75	40	60
Wilcox silty clay loam, moderately steep phase	VIIe-2											20	40
Wilcox silty clay loam, steep phase	VIIe-2											20	40

[1] Cow-acre-days is the number of days 1 acre will graze 1 cow without injury to the pasture.

Loblolly pine-hardwood

This forest cover type predominates in the Myatt-Stough-Prentiss general soil area. Loblolly pine, swamp chestnut oak-cherrybark oak, and sweetgum-Nuttall oak-willow oak are other forest types in the same general soil area. The soils are chiefly silt loam and very fine sandy loam. They occupy terraces in the Forested Coastal Plain (fig. 6). On Myatt silt loam, the site index for loblolly pine is 81 and that for shortleaf pine is 76. On Prentiss very fine sandy loam the site index is 86 for loblolly pine, and 77 for shortleaf pine. Most of the other forest cover types in this area include some pines. The sweetgum-Nuttall oak-willow oak type occurs on soils that are too wet to be suitable for pines.

Woodland Suitability Grouping

To assist owners of woodland in planning the use of their soils, the soils of Bradley County have been placed in seven woodland suitability groups. Each group consists of soils that are similar in potential productivity and in requirements for conservation practices and other management. Table 2 gives, for each of the suitability groups, site indexes for loblolly pine and shortleaf pine, and the relative severity of some of the limitations on timber production. The text first defines the degrees of limitation as rated in the table. Then, under each woodland suitability group, it lists the soils and explains the woodland management problems that apply to that group (*3*).

Site index.—The site index for a given species of tree on a given soil is the average height of the dominant and codominant trees in the stand at the age of 50 years. The site index is not a direct indicator of the potential productivity of a soil, but those soils that have the higher site indexes show the higher yields of commercial timber. The site index is the criterion least affected by drought, fire, insects, diseases, genetic influences, and other factors that affect the development of a stand of trees.

Plant competition.—When a site has been disturbed by fire, cutting, or other factors, undesirable species of brush, trees, and other plants may invade the site. This competition hinders the establishment and growth of desirable tree species (fig. 7).

A plant competition rating of slight indicates that invasion by undesirable species does not impede the natural regeneration and growth of the designated species of trees. No special management is needed.

A rating of moderate indicates that competition does not ordinarily prevent the establishment of adequate stands of the desired species of trees. Development of a normal fully stocked stand may take longer because the establishment of the seedlings is delayed and the early growth is slower.

A rating of severe indicates that natural regeneration cannot be relied upon. If seedlings are planted, competition should be controlled.

Equipment limitation.—Some soil characteristics and topographic features such as drainage, slope, number or size of stones, or soil texture, restrict or prohibit the use

***Figure 6.*—Loblolly pine-hardwood forest type on Myatt silt loam. Hardwoods have been girdled to release pines, and some pines have been removed by selective cutting. Pines are reseeding naturally.**

TABLE 2.—*Site indexes and problems of timber production by woodland suitability groups* [1]

Woodland suitability group	Site index		Plant competition	Equipment limitation	Seedling mortality	Windthrow hazard	Erosion hazard
	Loblolly pine	Shortleaf pine					
Group 1	82	71	Moderate	Moderate	Slight	Slight	Moderate to very severe.
Group 2	77	70	Moderate	Moderate	Slight	Slight	Moderate to very severe.
Group 3	81	76	Moderate	Severe to moderate.	Slight	Slight to moderate.	Slight.
Group 4	83	75	Moderate	Slight to moderate.	Slight	Slight	Moderate to very severe.
Group 5	84	74	Moderate	Slight	Slight	Slight	Moderate to very severe.
Group 6	93	(2)	Severe	Slight to severe.	Slight	Slight	Slight.
Group 7	These soils are not generally considered suitable for the production of pines.						

[1] The soils in each group are listed in the text under the heading of the appropriate woodland suitability group.
[2] Shortleaf pine does not ordinarily grow on these soils, and stands adequate for measurement of site index were not found.

of equipment commonly used in woodland management or in tree harvesting. Different soils may require different kinds of equipment, methods of operation, or seasons when equipment may be used.

An equipment limitation rating of slight indicates that there is no special problem in use of equipment.

A rating of moderate indicates that not all types of equipment can be used and that there are periods of no more than 3 months when equipment cannot be used.

A rating of severe indicates that the type of equipment than can be used is limited and that the periods when equipment cannot be used because of high water or wetness are more than 3 months long. Use of equipment can cause serious damage to the structure and stability of the soil.

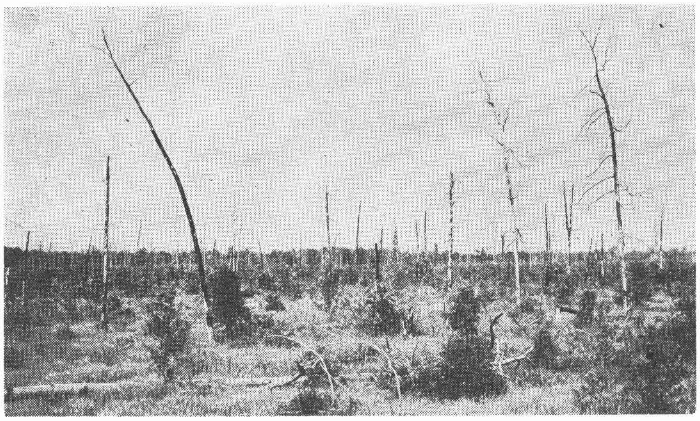

***Figure 7.*—Results of crown forest fire that destroyed all vegetation 5 years previously on poorly drained Myatt silt loam.**

Seedling mortality.—Even when healthy seedlings of the proper grade are correctly planted and the environment is normal, some of the planted stock will fail to survive because of unfavorable characteristics of the soil in which they are planted.

A rating of slight for seedling mortality indicates that ordinary losses from this cause are not more than 25 percent of the planted stock.

A rating of moderate indicates that losses are between 25 and 50 percent of the planted stock.

A rating of severe indicates that more than half of the planted stock is likely to die.

Windthrow hazard.—Soil characteristics affect the development of tree roots, and this in turn determines the resistance of the tree to the force of the wind. It is important to know the degree of this hazard when choosing tree species for planting or when planning release cuttings and harvest cuttings.

A rating of slight indicates that the roots of the desired species of trees develop normally, and windthrow is not common.

A rating of moderate indicates that the trees would remain standing unless the wind velocity was high and the soil excessively wet.

A rating of severe indicates that the soil does not allow adequate rooting for stability. A high water table, a hardpan, or bedrock may restrict the depth of roots.

Erosion hazard.—It is possible to protect woodland from erosion by growing certain species of trees, by adjusting the rotation age and cutting cycles, by using special techniques in management, and by careful construction and maintenance of roads, trails, and landings.

Level and nearly level soils normally have a slight erosion hazard.

Gently to moderately sloping soils with a medium-textured surface layer normally have a moderate to severe erosion hazard.

Soils that have a very slowly permeable subsurface horizon, a coarse-textured surface horizon, and gentle to moderate slopes have a severe to very severe erosion hazard. Soils on steep slopes and escarpments also have a severe to very severe erosion hazard.

Woodland suitability group 1

This group consists of deep, fine-textured, very slowly permeable soils. Slopes range from 0 to more than 20 percent. The soils have a thin, silty clay loam surface soil and a clay subsoil. Internal drainage is somewhat poor, and the available moisture holding capacity is low to moderate.

The soils in this group are—

- Wilcox silty clay loam, level phase.
- Wilcox silty clay loam, nearly level phase.
- Wilcox silty clay loam, gently sloping phase.
- Wilcox silty clay loam, eroded gently sloping phase.
- Wilcox silty clay loam, moderately steep phase.
- Wilcox silty clay loam, steep phase.

The site index for loblolly pine is higher on these soils than the index for shortleaf pine. As measured by the Doyle rule, the annual normal yield from a 50-year-old, fully stocked, unmanaged stand of loblolly pine is 250 board feet per acre. Under the same conditions, a stand of shortleaf pine yields 183 board feet per acre annually.

Competition from undesirable species of plants and trees does not generally prevent establishment of a good stand of pine. It sometimes delays it, however, and usually retards growth.

Late in winter and early in spring there are periods when these soils are too wet to permit the use of heavy logging equipment. These wet periods usually last less than 3 months.

The erosion hazard is severe to very severe on the more sloping soils. The location of roads and skid trails and the use of equipment should conform as nearly as practical to the contour. Landings should be located where they will not increase the erosion hazard. Disturbance of plant cover can increase the erosion hazard.

Woodland suitability group 2

This group consists of deep, medium-textured, slowly permeable soils that have a thin surface soil of sandy loam or sandy gravelly loam. The subsoil is of plastic clay. Drainage is moderately good, and the available moisture holding capacity is low to moderate. Slopes range from 0 to 20 percent.

The soils in this group are—

- Boswell very fine sandy loam, nearly level phase.
- Boswell very fine sandy loam, eroded nearly level phase.
- Boswell very fine sandy loam, gently sloping phase.
- Boswell very fine sandy loam, eroded gently sloping phase.
- Boswell very fine sandy loam, 8 to 20 percent slopes.
- Boswell gravelly fine sandy loam, nearly level phase.
- Boswell gravelly fine sandy loam, gently sloping phase.
- Boswell gravelly fine sandy loam, eroded gently sloping phase.
- Boswell sandy clay, severely eroded gently sloping phase.

These soils have a higher site index for loblolly pine than for shortleaf pine. The annual normal yield from a 50-year-old, fully stocked, unmanaged stand of pines is 200 board feet per acre for loblolly pine or 173 board feet per acre for shortleaf pine, by the Doyle rule.

Plant competition, equipment limitations, and erosion hazard are essentially the same for this group as for woodland suitability group 1.

Woodland suitability group 3

This group consists of deep, medium-textured, slowly to very slowly permeable soils. Slopes range from 0 to 3 percent. The surface soil is silt loam. The subsoil may be sandy clay, silty clay, or clay. Drainage is somewhat poor to poor. The available moisture holding capacity is low. The Pheba and Stough soils contain a fragipan at a depth of about 25 to 30 inches.

The soils in this group are—

- Caddo and Tickfaw silt loams.
- Leaf silt loam.
- Myatt silt loam.
- Myatt-Kalmia complex, mound phase.
- Pheba and Lewiston soils, level phases.
- Pheba and Lewiston soils, nearly level phases.
- Pheba and Lewiston soils, eroded nearly level phases.
- Stough very fine sandy loam, level phase.
- Stough very fine sandy loam, nearly level phase.
- Stough-Kalmia complex, mound phase.

The site index for loblolly pine averages a little higher on these soils than the index for shortleaf pine. A 50-year-old, fully stocked, unmanaged stand of loblolly pine will yield 240 board feet per acre annually, Doyle rule, as compared to 232 board feet per acre for shortleaf pine under the same conditions.

Competition from undesirable species is moderate and generally does not prevent establishment of a good stand of pine. It sometimes delays it, however, and growth is usually retarded (fig. 8).

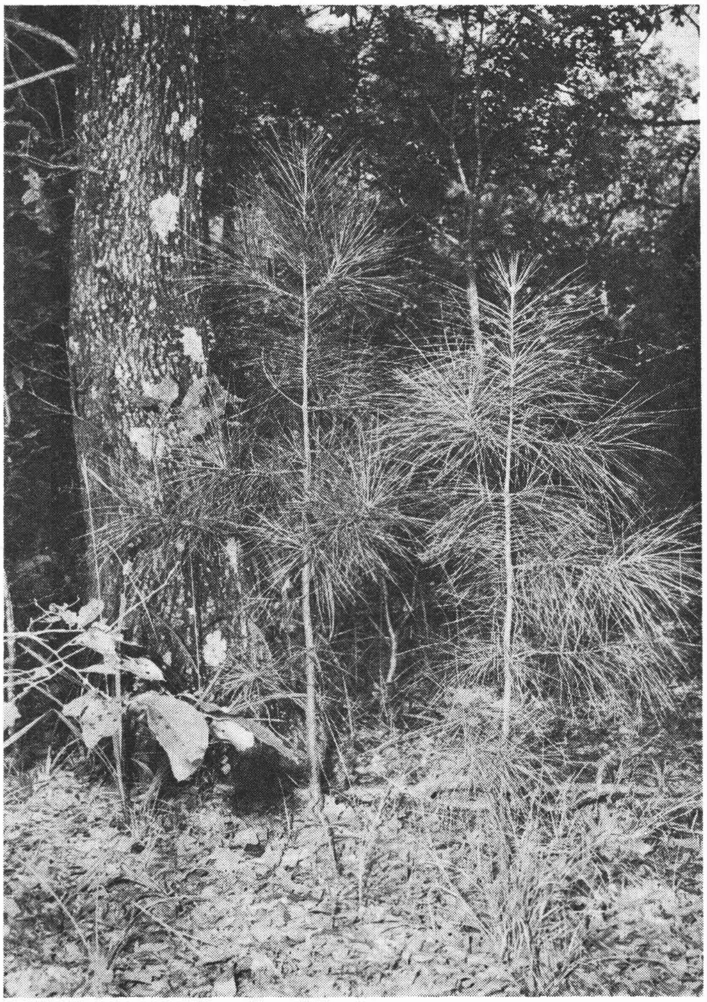

Figure 8.—**Pine seedlings overtopped by cull oak trees. These pines are about 7 years old and are only 4½ feet tall. The soil is Caddo silt loam.**

For 3 to 6 months of the year, the Caddo, Tickfaw, Leaf, and Myatt soils are wet enough so that if heavy equipment is used it will bog down and soil structure and stability will be damaged. On the other soils of this

group, the period when the use of equipment is limited does not usually exceed 3 months late in winter and early in spring.

Windthrow is a moderate problem on the Caddo, Tickfaw, and Myatt soils if high winds blow when the soils are very wet.

Woodland suitability group 4

This group consists of deep, medium-textured, slowly permeable soils. Slopes range from 0 to 20 percent. The surface soil is very fine sandy loam or fine sandy loam, and in some places it is gravelly. The subsoil is sandy clay loam, sandy clay, or clay. The drainage is moderately good to somewhat poor. The available moisture holding capacity is moderate. The Prentiss and Savannah soils have a fragipan at a depth of about 25 to 30 inches.

The soils in this suitability group are—

Prentiss very fine sandy loam, level phase.
Prentiss very fine sandy loam, nearly level phase.
Prentiss very fine sandy loam, eroded nearly level phase.
Prentiss very fine sandy loam, gently sloping phase.
Prentiss very fine sandy loam, eroded gently sloping phase.
Prentiss very fine sandy loam, sloping phase.
Prentiss very fine sandy loam, mound phase.
Prentiss very fine sandy loam, eroded mound phase.
Savannah very fine sandy loam, level phase.
Savannah very fine sandy loam, nearly level phase.
Savannah very fine sandy loam, eroded nearly level phase.
Savannah very fine sandy loam, gently sloping phase.
Savannah very fine sandy loam, eroded gently sloping phase.
Savannah very fine sandy loam, sloping phase.
Sawyer very fine sandy loam, level phase.
Sawyer very fine sandy loam, nearly level phase.
Sawyer very fine sandy loam, eroded nearly level phase.
Sawyer very fine sandy loam, gently sloping phase.
Sawyer very fine sandy loam, eroded gently sloping phase.
Sawyer very fine sandy loam, moderately steep phase.
Shubuta fine sandy loam, eroded nearly level phase.
Shubuta fine sandy loam, eroded gently sloping phase.
Shubuta gravelly fine sandy loam, moderately steep phase.

These soils have a higher site index for loblolly pine than they do for shortleaf pine (fig. 9). A 50-year-old, fully stocked, unmanaged stand of loblolly pine will yield 260 board feet per acre each year, Doyle rule, while a similar stand of shortleaf pine will yield 222 board feet.

Figure 9.—**An 8-year-old planting of loblolly pine on a formerly cultivated field of Savannah very fine sandy loam, eroded gently sloping phase.**

Competition and erosion hazards are the same as for woodland suitability group 1. Limitations on the use of equipment are the same on the Sawyer soils as on the soils in group 1. The other soils in group 4 have only slight limitations on the use of equipment.

Woodland suitability group 5

This group consists of deep, medium-textured, permeable soils. Slopes range from 0 to 25 percent. The surface soil is sandy loam, fine sandy loam, or gravelly fine sandy loam. The subsoil is sandy clay loam. The available moisture holding capacity ranges from moderate to high.

The soils in this group are—

Cahaba sandy loam, nearly level phase.
Cahaba sandy loam, gently sloping phase.
Cahaba sandy loam, eroded gently sloping phase.
Cahaba sandy loam, sloping phase.
Kalmia fine sandy loam, nearly level low terrace phase.
Kalmia fine sandy loam, gently sloping low terrace phase.
Orangeburg fine sandy loam, gently sloping phase.
Orangeburg fine sandy loam, eroded gently sloping phase.
Orangeburg fine sandy loam, sloping phase.
Orangeburg and Ruston fine sandy loams, moderately steep phases.
Ruston fine sandy loam, nearly level phase.
Ruston fine sandy loam, gently sloping phase.
Ruston fine sandy loam, eroded gently sloping phase.
Ruston sandy clay loam, severely eroded gently sloping phase.
Ruston fine sandy loam, sloping phase.
Saffell gravelly fine sandy loam, gently sloping phase.
Saffell gravelly fine sandy loam, eroded gently sloping phase.
Saffell gravelly fine sandy loam, severely eroded gently sloping phase.
Saffell gravelly fine sandy loam, sloping phase.
Saffell gravelly fine sandy loam, eroded sloping phase.
Saffell gravelly fine sandy loam, 12 to 25 percent slopes.

The site index for loblolly pine on these soils is higher than the index for shortleaf pine. A 50-year-old, fully stocked, unmanaged stand of loblolly pine will yield 270 board feet per acre annually, Doyle rule, and under the same conditions a stand of shortleaf pine will yield 212 board feet per acre.

Plant competition is about the same as for woodland suitability group 1. The sloping soils of the Orangeburg and Ruston series have a severe to very severe hazard of erosion.

Woodland suitability group 6

This group consists of deep, medium-textured, permeable to slowly permeable soils. All are nearly level; slopes are less than 1 percent. The surface soil and subsoil of Mixed alluvial land range from clay to sand. The surface soil of the other mapping units is silt loam or fine sandy loam, and the subsoil is very fine sandy loam, silt loam, or silty clay loam. Drainage ranges from poor to good. The available moisture holding capacity is moderate.

The mapping units in this group are—

Bibb silt loam.
Iuka-Mantachie silt loams.
Mixed alluvial land.
Ochlockonee fine sandy loam.

The site index for loblolly pine on these soils is 93. Fully stocked, 50-year-old, unmanaged stands of loblolly pine normally yield 369 board feet per acre per year,

measured by the Doyle rule. The site index for shortleaf pine could not be measured because this species does not grow naturally on these soils.

Loblolly pine has severe competition from various species of hardwood trees. The major forest cover on the Bibb and Ochlockonee soils is the sweetgum-Nuttall oak-willow oak cover type. These hardwoods are probably the climax vegetation for these soils (*7*).

On the Bibb and Mantachie soils and on Mixed alluvial land, the use of heavy equipment is restricted for periods of 3 to 6 months or longer because of wetness or flooding. Heavy equipment can be used on the other soils most of the time, but it is generally impossible to get to them because they are surrounded by the wet soils. Logging equipment should be used that will not damage the structure and stability of the soil too much.

Woodland suitability group 7

This group consists of deep, fine-textured and medium-textured, very slowly permeable to slowly permeable soils. Slopes range from 0 to more than 20 percent. The surface soil and subsoil of Gullied land varies in texture, as this land type may have developed from any of the soils in the county. The other mapping units have a surface soil of silty clay and very fine sandy loam and a subsoil of silty clay loam to clay. Drainage is somewhat poor to good. The available moisture holding capacity is low to moderate.

The mapping units in this suitability group are—

Chastain silty clay.
Gullied land.
Lafe very fine sandy loam.

The site index for loblolly pine or shortleaf pine on Gullied land varies according to the amount of surface soil that is gone. Most areas are not considered suitable for pines. Those areas of Gullied land that still have commercial possibilities as woodland are generally in the same woodland suitability group as the soil from which the Gullied land developed.

Pines do not normally grow on the Chastain soil because it is flooded for long periods. The Lafe series is generally too alkaline for pines.

Yields From Woodland

Yields from stands that are unmanaged, though fully stocked, are not considered a true measure of productivity. They do, however, show how the productivity of one site is related to that of another. They also make it possible to compare yields of loblolly pine with yields of shortleaf pine on a given soil.

Table 3 shows the growth of and yields from unmanaged stands of loblolly pine and shortleaf pine.

It is possible, by comparing the current economic value of the potential yields from woodland with the value of the potential yields of other crops, to determine the best economic use of the land.

Comparisons of the yields of loblolly pine and shortleaf pine can be made for each woodland suitability group, as a basis for deciding which species should be planted or encouraged. On most soils in Bradley County, loblolly pine brings a greater return in wood products than shortleaf pine.

The age at which pulpwood trees should be ready for the first thinning is related to the site index.

TABLE 3.—*Stand and yield information for fully stocked, unmanaged, second-growth stands of loblolly pine and shortleaf pine*

[Yield figures are cumulative—they include all volumes harvested in prior thinnings. Absence of a figure indicates that timber of the specified size is not generally used for the specified purpose. Statistics are compiled from United States Department of Agriculture Miscellaneous Publication No. 50 (*9*)]

Site index	Age	Total merchantable volume per acre		Average diameter at breast height
	Years	*Cords of rough wood*	*Board feet (Doyle rule)*	*Inches*
LOBLOLLY PINE				
70	20	17	----------	5.4
	30	31	1,000	7.8
	40	42	3,500	9.6
	50	50	6,500	10.9
	60	55	10,000	12.1
	70	59	12,500	13.0
	80	62	15,000	13.8
80	20	22	----------	6.2
	30	38	2,000	8.7
	40	51	6,000	10.7
	50	60	11,500	12.2
	60	66	16,000	13.6
	70	70	19,500	14.6
	80	73	22,000	15.5
90	20	27	----------	6.9
	30	46	4,000	9.6
	40	61	10,000	11.7
	50	71	16,500	13.6
	60	78	22,000	15.0
	70	82	26,000	16.2
	80	85	29,000	17.2
100	20	32	500	7.4
	30	53	6,000	10.4
	40	71	14,500	12.8
	50	84	23,000	14.7
	60	92	29,500	16.2
	70	96	33,000	17.6
	80	100	35,500	18.6
SHORTLEAF PINE				
60	20	12	----------	----------
	30	32	----------	5.7
	40	46	1,550	7.3
	50	54	4,350	8.4
	60	60	7,600	9.7
	70	65	10,250	10.6
	80	68	12,700	11.4
70	20	18	----------	4.5
	30	41	750	6.6
	40	56	4,000	8.4
	50	66	8,650	9.8
	60	73	12,600	11.0
	70	79	16,250	12.0
	80	83	19,400	12.8
80	20	25	----------	5.2
	30	48	1,950	7.5
	40	65	7,650	9.5
	50	77	13,550	11.1
	60	85	18,850	12.3
	70	92	23,450	13.3
	80	97	27,550	14.2
90	20	30	----------	6.1
	30	54	4,550	8.8
	40	73	12,600	10.9
	50	87	20,450	12.6
	60	98	27,400	14.0
	70	105	32,850	15.2
	80	112	37,400	16.2

Engineering Properties of the Soils [3]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, erosion control structures, drainage systems, and sewage disposal systems. The properties most important to the engineer are permeability to water, shear strength, consolidation characteristics, texture, plasticity, and pH. Depth of unconsolidated materials and topography are also important.

The information in this report can be used to—

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils that will help in the planning of agricultural drainage systems, farm ponds, irrigation systems, terraces, waterways, and diversion terraces.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting highway and airport locations and in planning detailed investigations of selected locations.
4. Locate probable sources of gravel, sand, and other construction materials.
5. Correlate performance of engineering structures with soil mapping units, and thus develop information that will be useful in designing and maintaining the structures.
6. Determine the suitability of soil units for cross-country movements of vehicles and construction equipment.
7. Supplement information obtained from other published maps and reports and aerial photographs for the purpose of making maps and reports that will be more useful to engineers.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.

It is not intended that this report will eliminate the need for on-site sampling and testing of sites for design and construction of specific engineering works and uses. It should be used primarily in planning more detailed field investigations to determine the in-place condition of the soil at the proposed construction site.

Some of the terms used by the agricultural soil scientist may be unfamiliar to the engineer, and some words may have special meanings in soil science. These terms are defined in the glossary at the end of the report.

Engineering Classification Systems

Two systems of classifying soils, the AASHO and the Unified, are in general use among engineers. Both will be used in this report. These classification systems are explained in the PCA Soil Primer (*5*).

AASHO classification system

Most highway engineers classify soil materials in accordance with the system approved by the American Association of State Highway Officials (*1*). In this system, classification is based on the gradation, liquid limit, and plasticity index of the soil. Highway performance has been related to this system of classification. All soil materials are classified in seven principal groups. The groups range from A-1 (gravelly soils of high bearing capacity, the best soils for subgrades) to A-7 (clay soils having low strength when wet, the poorest soils for subgrades). Within each group, the relative engineering value of the soil material is indicated by a group index number. Group indexes range from 0 for the best materials to 20 for the poorest. The group index number is in parentheses after the soil group symbol, as in table 4.

Unified classification system

Some engineers prefer to use the Unified soil classification system established by the Waterways Experiment Station, Corps of Engineers (*13*). This system is based on identification of soils according to their texture and plasticity and their performance as engineering construction materials. Soil materials are identified as coarse grained (8 classes), fine grained (6 classes), or highly organic. The classification of the tested soils according to the Unified system is given in table 4, and the estimated classification of all the soils is given in table 6.

Engineering Test Data

Soil samples from seven of the principal soil series of Bradley County were tested by standard AASHO procedures to help evaluate the soils for engineering purposes. Only selected layers of each soil were sampled. The results of these tests are presented in table 4.

The engineering soil classifications in table 4 are based on data obtained by grain size analysis and by tests to determine liquid limit and plastic limit. The grain size analysis was made by a combination of the sieve and hydrometer methods. The percentage of clay obtained by the hydrometer method should not be used in naming soil textural classes.

The liquid limit and plastic limit tests measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a solid to a semisolid or plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content, expressed as a percentage of the oven-dry weight of the soil, at which the soil material passes from a solid to a plastic state. The liquid limit is the moisture content at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which the soil material is in a plastic condition. Some silty and sandy soils are nonplastic; that is, they will not become plastic at any moisture content.

Table 4 also gives moisture-density, or compaction, data for the tested soils. If a soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material will increase until the "optimum moisture content" is reached. After that, the density decreases with increase in moisture content. The highest dry density obtained in the compaction test is termed "maximum dry density." Moisture-density data are

[3] WILLIAM E. ARNOLD, agricultural engineer, Soil Conservation Service, assisted in the preparation of this section of the report.

TABLE 4.—*Engineering test data for*

[Tests performed by the Bureau of Public Roads in accordance with standard

Soil name and location	Bureau of Public Roads laboratory number	Depth	Horizon	Moisture-density		Liquid limit	Plasticity index	Mechanical analysis[1]		
								Percentage passing sieve—		
				Maximum dry density	Optimum moisture			1½-in.	1-in.	¾-in.
		Inches		*Lb. per cu. ft.*	*Percent*					
Lafe very fine sandy loam	S33171	4–13	B_{21ca}	124	11	20	7			
(1.5 miles east of Saline River	S33172	13–30	B_{22ca}	114	16	44	29			
and 110 feet south of State	S33173	30–52	C	118	13	33	19			
Highway 4.)	S33174	52–78+	D	99	16	(4)	(4)			
Bibb silt loam	S33349	0–8	A_1	114	13	19	3			
(NW¼SW¼ sec. 13, T. 14 S.,	S33350	8–28	A_2	114	12	19	3			
R.10 W.)	S33351	28–48	C_1	119	13	22	6			
Boswell very fine sandy loam	S33161	3–10	A_2	124	10	(4)	(4)			100
(SE¼NW¼ sec. 4, T. 12 S.,	S33162	10–18	B_2	95	27	62	33			
R. 10 W.)	S33163	18–72	C	105	21	47	24			
Boswell very fine sandy loam	S33164	6–14	A_2	119	10	(4)	(4)		100	98
(NE¼SE¼ sec. 2, T. 13 S., R.	S33165	14–22	B_2	94	25	70	37			100
10 W.)	S33166	22–72	C	103	21	50	25			
Boswell gravelly fine sandy loam	S33167	5–9	A_2	123	9	17	2	100	99	98
(0.5 mile east of Ebenezer Church	S33168	9–21	B_2	89	27	75	37			100
and 100 feet north of State	S33169	21–33	B_3	91	27	71	35			100
Highway 4.)	S33170	33–72+	C	95	23	64	33			100
Myatt silt loam	S33337	0–8	A_{2g}	109	15	24	4			
(100 feet southeast of junction	S33338	8–20	B_{2g}	115	14	25	7			
of Moro-Banks and Moro-	S33339	20–35	B_{3mg}	114	15	29	10			
Warren Highways.)	S33340	35–47+	C_{1g}	112	16	33	15			
Myatt silt loam	S33341	0–8	A_g	103	17	23	2			
(NW¼NW¼ sec. 12, T. 16 S.,	S33342	8–25	B_{1g}	108	14	23	3			
R. 12 W.)	S33343	25–35	B_{2g}	112	15	24	4			
	S33344	35–49	C_{1g}	113	14	30	10			
Ruston fine sandy loam	S33175	5–10	A_{22}	124	8	(4)	(4)			
(0.2 mile north of Hickory	S33176	16–30	B_{21}	121	12	26	10			
Springs Church and 50 feet	S33177	39–64	C	115	11	(4)	(4)			
east of State Highway 15.)										
Ruston fine sandy loam	S33178	0–8	A	127	8	14	2			
(NW¼NW¼ sec. 6, T. 14 S., R.	S33179	8–23	B	122	13	31	15			100
9 W.)	S33180	23–65+	C	131	8	(4)	(4)	100	99	98
Ruston fine sandy loam	S33181	2–12	A_2	126	9	14	2			
(SE¼SE¼ sec. 14, T. 12 S., R.	S33182	12–72	B	124	11	21	6			
12 W.)	S33183	72–90+	C	126	10	22	7			
Savannah very fine sandy loam	S33184	5–13	A_2	118	10	16	1			
(200 feet south of Ebenezer	S33185	20–36	B_2	124	11	22	5			
Church and south of State	S33186	36–45	B_{3m}	123	12	24	7			
Highway 4.)	S33187	45–72	C	121	12	24	7			
Savannah very fine sandy loam	S33188	5–13	A_2	118	11	17	2			
(SE¼SW¼ sec. 27, T. 12 S., R.	S33189	17–31	B_2	117	14	32	15			
10 W.)	S33190	31–41	B_{3m}	115	16	32	13			
	S33191	41–62+	C	110	18	39	20			
Savannah very fine sandy loam	S33192	5–11	A_2	120	10	17	2			
(SE¼NW¼ sec. 2, T. 15 S., R. 10	S33193	11–18	B_1	123	11	22	6			
W.)	S33194	18–31	B_{2m}	120	13	27	10			
	S33195	31–65+	C	110	17	37	16			
Stough very fine sandy loam	S33345	0–7	A_2	115	11	(4)	(4)			
(100 feet west of Tram Road in	S33346	22–28	B_{2m}	122	12	19	5			
northwest corner of NW¼SE¼	S33347	28–42	B_3	122	12	22	7			
sec. 1, T. 16 S., R. 10 W.)	S33348	42–64	C_1	118	13	22	8			

[1] Mechanical analyses according to the American Association of State Highway Officials Designation: T 88. Results by this procedure frequently differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service. In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions.

soil samples taken from 14 soil profiles

procedures of the American Association of State Highway Officials (AASHO)]

Mechanical analysis [1]—Continued										Classification	
Percentage passing sieve—Continued						Percentage smaller than—				AASHO [2]	Unified [3]
⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.		
--------	--------	109	96	92	62	57	43	21	17	A-4(5)	ML-CL.
--------	--------	100	99	97	76	73	59	40	31	A-7-6(16)	CL.
--------	--------	--------	100	97	70	67	53	32	24	A-6(11)	CL.
--------	--------	--------	100	97	24	15	5	2	2	A-2-4(0)	SM.
--------	--------	100	97	90	69	64	46	15	7	A-4(7)	ML.
--------	--------	100	97	93	76	72	54	19	8	A-4(8)	ML.
--------	--------	100	97	93	79	75	57	27	16	A-4(8)	ML-CL.
98	93	81	74	72	34	29	19	7	6	A-2-4(0)	SM.
--------	--------	100	98	97	68	65	60	53	50	A-7-6(18)	CH.
100	99	98	97	96	53	49	41	35	34	A-7-6(10)	CL.
90	84	80	78	76	34	30	19	7	4	A-2-4(0)	SM.
99	98	97	96	95	68	65	58	52	50	A-7-5(18)	MH-CH.
--------	--------	--------	100	99	53	48	41	38	36	A-7-6(10)	CL.
85	66	53	47	42	25	21	13	6	5	A-1-b	SM.
99	96	91	86	82	70	67	61	54	54	A-7-5(18)	MH.
99	98	97	95	91	78	76	67	56	53	A-7-5(20)	MH.
99	98	98	97	95	76	72	61	50	47	A-7-5(20)	MH-CH.
--------	--------	--------	--------	100	99	95	65	29	16	A-4(8)	ML-CL.
--------	--------	--------	--------	100	99	95	68	33	19	A-4(8)	ML-CL.
--------	--------	--------	--------	100	99	95	70	38	24	A-4(8)	CL.
--------	--------	--------	--------	100	99	96	73	43	32	A-6(10)	CL.
--------	--------	--------	--------	100	95	91	62	13	8	A-4(8)	ML.
--------	--------	--------	--------	100	96	92	67	18	10	A-4(8)	ML.
--------	--------	--------	--------	100	97	93	68	23	16	A-4(8)	ML-CL.
--------	--------	--------	--------	100	97	94	69	26	19	A-4(8)	CL.
--------	--------	100	97	76	34	32	23	10	6	A-2-4(0)	SM.
--------	--------	100	97	80	45	44	35	23	18	A-4(2)	SC.
100	99	99	95	74	19	17	13	8	6	A-2-4(0)	SM.
100	99	97	81	55	33	31	21	10	7	A-2-4(0)	SM.
99	95	90	77	59	44	43	36	23	19	A-6(3)	SC.
87	72	58	42	28	16	15	11	6	5	A-1-b(0)	SM.
--------	--------	100	99	87	43	42	33	16	11	A-4 (2)	SM.
--------	--------	100	99	84	38	37	30	21	19	A-4 (1)	SM-SC.
--------	--------	100	99	84	44	43	35	20	17	A-4 (2)	SM-SC.
100	99	97	94	89	57	49	27	11	7	A-4 (4)	ML.
100	99	96	93	89	60	54	35	16	13	A-4 (5)	ML-CL.
100	99	97	95	90	60	54	35	18	16	A-4 (5)	ML-CL.
100	99	97	95	90	59	52	32	19	17	A-4 (5)	ML-CL.
--------	--------	100	99	98	67	58	35	14	10	A-4 (6)	ML.
--------	--------	100	99	98	73	67	47	28	24	A-6 (10)	CL.
--------	--------	100	99	98	75	69	50	31	26	A-6 (9)	CL.
--------	--------	100	99	98	76	70	53	37	32	A-6 (12)	CL.
100	99	97	95	93	66	55	34	14	10	A-4 (6)	ML.
100	99	95	93	91	64	58	39	18	15	A-4 (6)	ML-CL.
100	99	96	94	92	69	60	40	22	17	A-4 (7)	CL.
--------	--------	--------	--------	100	54	47	37	33	30	A-6 (6)	CL.
--------	--------	100	99	92	61	53	33	7	4	A-4 (5)	ML.
--------	--------	100	99	94	67	62	42	15	11	A-4 (6)	ML-CL.
--------	--------	100	99	93	69	63	44	18	15	A-4 (7)	ML-CL.
--------	--------	100	99	93	69	64	46	22	17	A-4 (7)	CL.

The mechanical analyses used in this table are not suitable for use in naming textural classes for soils.

[2] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 7): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes. AASHO Designation: M 145–49.

[3] Based on the Unified Soil Classification System, Technical Memorandum No. 3–357, Volume 1, Waterways Experiment Station, Corps of Engineers, March 1953.

[4] Nonplastic.

important in earthwork, for, as a rule, soil is most stable if it is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

Table 5 shows the bulk density and soil moisture data for four silt loams. Other data on these samples are given in the section on soil classification.

TABLE 5.—*Bulk density and available-water data for four silt loams*[1]

Soil type and sample number	Depth	Bulk density[2]	Moisture in soil at tension of—		Available moisture capacity	
			⅓ atmosphere equivalent	15 atmosphere equivalents		
	Inches		*Percent*[3]	*Percent*[4]	*Percent*	*Inches per foot*
Myatt silt loam S-57-Ark-6-2 (1-5).	0-8	1. 43	24. 2	5. 8	18. 4	3. 16
	8-20	1. 42	23. 1	6. 9	16. 2	2. 76
	20-35	1. 59	26. 2	9. 5	16. 7	3. 19
	35-47	1. 52	29. 7	14. 0	15. 7	2. 86
Myatt silt loam S-57-Ark-6-3 (1-5).	0-8	1. 50	23. 2	2. 8	20. 4	3. 67
	8-25	1. 48	23. 8	4. 0	19. 8	3. 52
	25-35	1. 63	25. 7	7. 8	17. 9	3. 50
	35-49	1. 63	27. 1	9. 6	17. 5	3. 42
	49-61	1. 59	28. 6	9. 2	19. 4	3. 70
Caddo silt loam S-57-Ark-6-4 (1-6).	3-13	1. 53	17. 2	3. 6	13. 6	2. 50
	13-27	1. 72	18. 6	4. 5	14. 1	2. 91
	27-42	1. 59	20. 6	5. 2	15. 4	2. 94
	42-55	1. 75	20. 3	5. 7	14. 6	3. 07
	55-62	1. 69	21. 4	8. 4	13. 0	2. 64
Caddo silt loam S-57-Ark-6-5 (1-6).	2-13	1. 54	21. 5	3. 0	18. 5	3. 42
	13-26	1. 64	24. 9	8. 5	16. 4	3. 23
	26-40	1. 68	25. 5	8. 8	16. 7	3. 37
	40-51	1. 61	28. 3	12. 8	15. 5	2. 99
	51-64	1. 72	25. 8	12. 4	13. 4	2. 77

[1] Data furnished by the University of Arkansas, Soil Physics Laboratory.
[2] Weight of equal volume of water equals 1.00.
[3] Represents percent water in soil at field capacity.
[4] Represents percent water in soil at wilting point.

Soil Engineering Interpretations

Most of the soil problems in highway construction are caused by certain undesirable physical properties of the soil materials and by lack of adequate drainage. In this county, bedrock lies at such a great depth that it presents no problem in highway engineering.

Table 6 shows some estimated physical properties and soil classifications that are important in the construction of highways. The data are based on laboratory test results, experience with the same kinds of soil in other counties, and information in other sections of this report.

Table 7 indicates the suitability and adaptability of the various soils for various engineering uses. In this table are also given the soil features and problems that affect the use of the soil and some recommendations regarding highway and conservation engineering.

The suitability of the soils for topsoil is given because topsoil is needed to grow vegetation for erosion control on embankments, road shoulders, ditches, and cut slopes. Road shoulders that are intended to support only limited traffic should preferably be built of sandy loam.

The ratings given for adaptability to winter grading show the suitability of the soil for earthwork in winter and early in spring. These ratings are based on drainage and on the problems of working the soil materials when they are wet.

Many soils are ponded or have a high water table for part of each year (fig. 10). Roads across these soils must

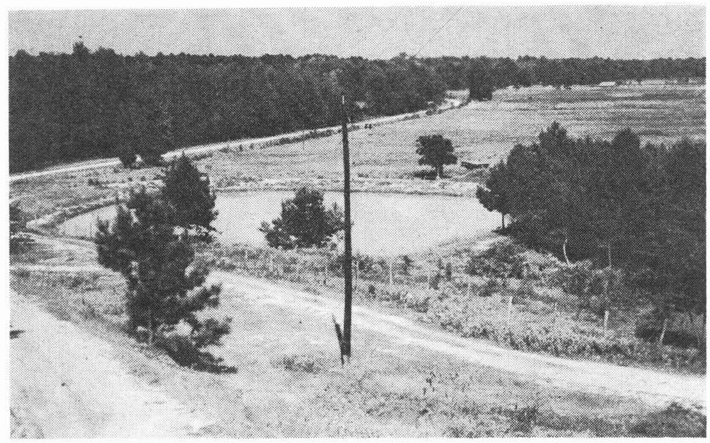

Figure 10.—**A stock pond built on Wilcox silty clay loam, a good soil for ponds.**

be constructed on embankment sections, or they must be provided with a good system of underdrains and surface drains. In lowlands and other areas that are sometimes flooded, roads should be constructed on a continuous embankment that is at least 4 feet above the probable high water mark.

The Pheba, Lewiston, Prentiss, Stough, and Savannah soils have a compact layer, or fragipan, a little below the surface. This layer impedes drainage through the soil. Water that collects above this layer forms a perched water table. The effects of this fragipan should be considered in roadway design.

In nearly level areas, side ditches of roads should extend below the fragipan. The pavement grade should be at least 4 feet above the top of the fragipan. In steeper areas, road cuts normally extend below the depth of the fragipan. Where the construction changes from a cut section to a fill section, it is necessary to provide good underdrainage. The fragipan should be dug out and replaced with more permeable material.

The very plastic subsoil layer in the Boswell, Chastain, Leaf, Sawyer, Wilcox, and Lafe soils presents the same general problem in highway construction as the fragipan in other soils. The same methods should be used to make sure that drainage is provided.

The clay layers in the Boswell, Chastain, Leaf, and Wilcox soils shrink greatly when they dry and swell when they become wet. If subgrades made of these soils are too wet when the pavement is constructed above them, the soil will shrink as it dries out under the edges of the pavement. This may cause the pavement to crack. If subgrades made of these soils are too dry, the pavement

that is laid over them later will warp as the soil absorbs moisture and swells. Pavements laid over plastic soils will crack and warp less if a thick layer of less plastic soil material is used as a foundation course beneath the pavement. This foundation course should extend through the road shoulder to provide adequate drainage.

The clay soil materials should be covered with a porous base course of sand and gravel to prevent pumping action under traffic. A thin layer of sand over these clay soils is desirable to minimize intrusion of clay into the overlying granular base course material. Clay materials are most subject to pumping action, but other kinds are also affected, especially if there is an undrained fragipan only a few inches or feet below the pavement.

If the road shoulders are wide and the slopes are less steep than normal, the material beneath the pavement will not change so much in volume. Another way to control shrinking and swelling of subgrade material is to compact it to maximum density at or slightly above the optimum moisture content, as determined by the AASHO compaction test.

Sand and gravel clean enough for concrete aggregate are found in commercial quantities only in the Saffell series and in the alluvial deposits in the Saline River bottoms.

The Cahaba, Orangeburg, Ruston, and Saffell soils have gravelly strata of Coastal Plain deposits. These deposits are possible sources of material for subbase and base courses of pavements. The material also can be used as surfacing for county roads. It is not suitable for use in concrete structures or for the surface course of a flexible pavement because it normally contains some clay.

A large part of this county is underlain by heavy clay and gravelly clay that have a tendency to slough and slide when they are very wet. They have a high shrink-swell potential. Their coefficient of internal friction is low. Soils that have these clay subsoils are a hazard to heavy construction or transportation of heavy equipment during very wet periods. In general, these subsoils are poorly drained; therefore, metals in contact with them corrode very easily.

All of the subsoils in the county, except one, are acid in reaction. They have a pH of from 4.0 to 5.5. The Lafe soil has a pH of more than 8 in the subsoil. The Lafe soil is underlain by deep deposits of river sand that begin at a depth of about 5 feet.

Clay subsoils are a considerable hazard in the construction of foundations for heavy buildings. One method that has been reasonably successful in recent years is to use flared-bottom, reinforced concrete pilings, capped by reinforced concrete grade beams. These beams are set from 6 to 15 inches below the surface of the ground, resting on the heavy clay or gravelly clay.

Frost action in this area does not extend to depths of more than about 4 to 6 inches, so damage from freezing is not a serious problem in construction.

Bedrock is more than 100 feet below the surface in all parts of the county.

Permeability, or ability of the soil to transmit water, is important in the construction of foundations, because the settlement of the structure depends on the rate at which moisture is squeezed from underneath the structure. For the same reason, permeability is important in constructing highway and railroad embankments and highway subgrades. Permeability must be considered in selecting material for ballast. It is also very important in determining the effectiveness of open drainage ditches, tile drainage, or disposal fields for sewage systems.

Most soils of this county have slow permeability. Foundation drainage for airports, roads, buildings, and basements is not usually successful unless the structure is underlain by at least 6 inches of washed gravel under which drain tile have been installed. Sewage disposal fields must be extensive. In some areas sewage disposal fields are not practical.

Drainage for agriculture is not a serious problem because most of the cultivated soils are sloping. The soils that would need drainage to be suitable for cultivation are mostly in woodland or are flooded frequently.

Sprinkling is the only practical way of irrigating these soils, because the slopes are too steep for other methods. Leveling to use other types of irrigation would be expensive and impractical. The soil is not very fertile, the topsoil is shallow, and a large amount of soil material would have to be moved. Irrigation is not worth while unless intensive cropping practices are used.

Descriptions of Soils

In this section each soil series of the county is described, and one of the soils in that series is described in detail. Other soils in the same series are described by comparison with the detailed description. Some information on the present use of each soil and its suitability for various crops is given.

The mapping units have been given names that show the series, the texture of the surface soil, the slope, and the degree of erosion if it is moderate or severe. If erosion is not indicated in the name of the mapping unit, it means that the soil has had little or no erosion. Areas that have little true soil are not identified by series but are called miscellaneous land types and are given descriptive names, such as Gullied land or Mixed alluvial land.

Information on management of each soil can be found in the section, Capability Groups of Soils. Soil tests will be needed to determine for the soils in each field the amounts of lime and fertilizer to use. Samples from 838 fields covering 7,141 acres in the uplands, and from 246 fields covering 2,443 acres on the stream terraces, were tested by the University of Arkansas Soil Testing Laboratory between 1946 and 1957. More than half of the soils tested were strongly acid, and most of them were low or very low in nitrogen, phosphorus, and potassium. You can get an analysis of your own soils through your local Agricultural Extension office.

The location and distribution of the individual soils are shown on the soil map in the back of this report. The approximate acreage and proportionate extent of each soil are given in table 8.

Bibb Series

The Bibb series consists of poorly drained, strongly acid to very strongly acid soils on recent alluvium. The surface soil is silt loam to fine sandy loam and is dark gray to light gray mottled with brown. The subsoil is

TABLE 6.—*Estimated physical*

Map symbol	Soil name	Slope	Description	Depth to seasonally high water table	Depth from surface	Permeability [1]
		Percent		*Feet*	*Inches*	*Inches per hour*
Bb	Bibb silt loam	0–1	Poorly drained, frequently flooded soil from recent alluvium derived from Forested Coastal Plain soils.	0	0 to 8 8 to 28 28 to 48	0.2 to 0.8 0.2 to 0.8 0.05 to 0.2
BwB	Boswell very fine sandy loam, nearly level phase.	1–3	Moderately well drained upland soils, consisting of thin sandy loam, or gravelly sandy loam over plastic clay. Substrata are thick beds of sand and silt.	6	0 to 10	2.5 to 5.0
BwB2	Boswell very fine sandy loam, eroded nearly level phase.	1–3			10 to 18	Less than 0.05.
BwC	Boswell very fine sandy loam, gently sloping phase.	3–8			18 to 72	Less than 0.05.
BwC2	Boswell very fine sandy loam, eroded gently sloping phase.	3–8				
BoC3	Boswell sandy clay, severely eroded gently sloping phase.	3–8				
BwE	Boswell very fine sandy loam, 8 to 20 percent slopes.	8–20				
BgB	Boswell gravelly fine sandy loam, nearly level phase.	1–3	Same as above	6	0 to 10	2.5 to 5.0
BgC	Boswell gravelly fine sandy loam, gently sloping phase.	3–8			10 to 18	Less than 0.05.
BgC2	Boswell gravelly fine sandy loam, eroded gently sloping phase.	3–8			18 to 72	Less than 0.05.
CT	Caddo and Tickfaw silt loams	0–1	Poorly drained upland soils consisting of silt loam over silty clay. Substrata are unconsolidated beds of sand, silt, and silty clay.	0	0 to 13 13 to 27 27 to 45	0.2 to 0.8 0.2 to 0.8 0.05 to 0.2
CaB	Cahaba sandy loam, nearly level phase	1–3	Well-drained stream terrace soils that have sandy loam surface soil over sandy clay loam to sandy loam subsoil.	10	0 to 12	2.5 to 5.0
CaC	Cahaba sandy loam, gently sloping phase	3–8			12 to 20	2.5 to 5.0
CaC2	Cahaba sandy loam, eroded gently sloping phase.	3–8			20 to 40	0.2 to 0.8
CaD	Cahaba sandy loam, sloping phase	8–12			40 to 52	2.5 to 5.0
Ch	Chastain silty clay	0–1	Poorly drained, frequently flooded soil from recent alluvium, consisting of a thin layer of silty clay over clay. Alluvium derived from Forested Coastal Plain soils.	0	0 to 10 10 to 42	Less than 0.05. Less than 0.05.
Gu	Gullied land	3–20	Severely eroded, gently sloping to steep land, on which gullies have cut deeply into substrata.	10		
IM	Iuka-Mantachie silt loams	0–1	Moderately well drained to somewhat poorly drained soils from recent alluvium, subject to flooding in winter and spring. Silt loam surface soil and silty clay loam subsoil that have some stratified layers of clay and sandy clay. Alluvium derived from Forested Coastal Plain soils.	1	0 to 15 15 to 30 30 to 48	0.2 to 0.8 0.05 to 0.2 0.05 to 0.2
KaB	Kalmia fine sandy loam, nearly level low terrace phase.	1–3	Moderately well drained stream terrace soils that have fine sandy loam surface soil over sandy clay loam subsoil. Derived from alluvium washed from upland soils.	10	0 to 10	2.5 to 5.0
KaC	Kalmia fine sandy loam, gently sloping low terrace phase.	3–8			10 to 47	0.2 to 0.8

See footnote at end of table.

properties of the soils

Classification			Percentage passing sieve—			Structure	Reaction	Shrink-swell potential
USDA textural class	Unified	AASHO	No. 4	No. 10	No. 200			
							pH	
Silt loam	ML	A-4		100	More than 35	Blocky	5.1 to 5.5	Low.
Silt loam	ML	A-4		100	More than 35	Blocky	4.5 to 5.0	Low.
Silty clay loam	ML to CL	A-4		100	More than 35	Blocky	4.5 to 5.0	Moderate.
Very fine sandy loam.	SM	A-2-4		More than 80	35 or less	Subangular blocky	5.6 to 6.0	Low.
Clay	CH	A-7-6		100	More than 35	Blocky	5.6 to 6.0	High.
Clay	CL	A-7-6		100	More than 35	Subangular blocky	5.6 to 6.0	High.
Gravelly fine sandy loam.	SM	A-1-b	80 or less	55 or less	25 or less	Subangular blocky	5.6 to 6.0	Low.
Clay	MH	A-7-5		More than 90	More than 35	Blocky	5.6 to 6.0	High.
Clay	MH to CH	A-7-5		More than 90	More than 35	Subangular blocky	5.6 to 6.0	High.
Silt loam	ML	A-4		100	More than 35	Subangular blocky	4.5 to 5.5	Low.
Silty clay loam	ML to CL	A-4		100	More than 35	Blocky	4.5 to 5.0	Moderate.
Silty clay to silty clay loam.	CL	A-6		100	More than 35	Blocky	4.5 to 5.0	Moderate to high.
Fine sandy loam	SM	A-2-4		100	35 or less	Granular	5.6 to 6.0	Low.
Sandy loam	SM	A-2-4		100	35 or less	Blocky	5.1 to 5.5	Low.
Sandy clay loam	SC	A-4		100	More than 35	Blocky	5.1 to 5.5	Moderate.
Sandy loam	SM	A-2-4		100	35 or less	Blocky	5.1 to 5.5	Low.
Clay	CH	A-7-6		100	More than 35	Subangular blocky	4.5 to 5.5	High.
Clay	CH	A-7-6		100	More than 35	Massive	4.5 to 5.0	High.
	Variable							
Silt loam	ML	A-4		100	More than 35	Subangular blocky	5.6 to 6.0	Low.
Silty clay loam	ML to CL	A-4		100	More than 35	Blocky	4.5 to 5.0	Moderate.
Silty clay loam	ML to CL	A-4		100	More than 35	Blocky	4.5 to 5.0	Moderate.
Fine sandy loam	SM	A-2-4		100	35 or less	Single grained	5.1 to 6.0	Low.
Sandy clay loam	SC	A-4		100	More than 35	Blocky	5.1 to 5.5	Moderate.

TABLE 6.—*Estimated physical*

Map symbol	Soil name	Slope	Description	Depth to seasonally high water table	Depth from surface	Permeability [1]
		Percent		*Feet*	*Inches*	*Inches per hour*
La	Lafe very fine sandy loam	0–1	Poorly drained stream terrace soil that consists of a thin layer of very fine sandy loam over plastic clay. Coarse sand lies at a depth of about 50 inches. Derived from sediments deposited by the Saline River.	0	0 to 4	0.8 to 2.5
					4 to 13	0.2 to 0.8
					13 to 30	Less than 0.05.
					30 to 52	Less than 0.05.
					52 to 70	More than 10.
Le	Leaf silt loam	0–1	Poorly drained stream terrace soil that has silt loam surface soil and clay subsoil. Derived from old alluvium washed from upland soils.	4	0 to 4	0.2 to 0.8
					4 to 16	Less than 0.05.
					16 to 42	Less than 0.5.
Ma	Mixed alluvial land	0–1	Well-drained to poorly drained, frequently flooded soils on alluvium along the small streams. Horizons vary. Derived from Forested Coastal Plain soils.	0		
Mb	Myatt silt loam	0–1	Poorly drained stream terrace soils that have thick silt loam surface soil over silty clay loam subsoil. Derived from alluvium washed from upland soils. Some areas contain moderately well drained mounds.	0	0 to 25	0.2 to 0.8
MK	Myatt-Kalmia complex, mound phase	0–1		0	25 to 35	0.05 to 0.2
					35 to 58	Less than 0.05.
Oc	Ochlockonee fine sandy loam	0–1	Well-drained soil from recent alluvium on bottom land, consisting of fine sandy loam surface soil over silty clay loam subsoil. Derived from Forested Coastal Plain soils.	2	0 to 8	2.5 to 5.0
					8 to 50	0.8 to 2.5
					50 to 63	0.2 to 0.8
OfC	Orangeburg fine sandy loam, gently sloping phase.	3–8	Well-drained, upland soils that have fine sandy loam surface soil over sandy clay loam, derived from unconsolidated beds of sand and sandy clay.	10	0 to 12	2.5 to 5.0
OfC2	Orangeburg fine sandy loam, eroded gently sloping phase.	3–8			12 to 90	0.8 to 2.5
OfD	Orangeburg fine sandy loam, sloping phase	8–12				
ORE	Orangeburg and Ruston fine sandy loams, moderately steep phases.	12–20				
PLA	Pheba and Lewiston soils, level phases	0–1	Somewhat poorly drained upland soils that have silt loam surface soil over silty clay loam that contains a fragipan. Substrata contain unconsolidated beds of sand, silt, and silty clay.	2	0 to 10	0.2 to 0.8
PLB	Pheba and Lewiston soils, nearly level phases.	1–3			10 to 24	0.05 to 0.2
PLB2	Pheba and Lewiston soils, eroded nearly level phases.	1–3			24 to 32 (pan).	0.05 to 0.2
					32 to 48	0.05 to 0.2
PrA	Prentiss very fine sandy loam, level phase	0–1	Moderately well drained stream terrace soils that have very fine sandy loam surface soil over sandy clay loam subsoil that contains a sandy clay loam fragipan. Derived from old alluvium deposited by local streams.	4	0 to 15	0.8 to 2.5
PrB	Prentiss very fine sandy loam, nearly level phase.	1–3			15 to 25	0.2 to 0.8
PrB2	Prentiss very fine sandy loam, eroded nearly level phase.	1–3			25 to 36 (pan).	0.05 to 0.2
PrC	Prentiss very fine sandy loam, gently sloping phase.	3–8			36 to 52	0.2 to 0.8
PrC2	Prentiss very fine sandy loam, eroded gently sloping phase.	3–8				
PrD	Prentiss very fine sandy loam, sloping phase	8–12				
Ps	Prentiss very fine sandy loam, mound phase	0–1				
Ps2	Prentiss very fine sandy loam, eroded mound phase.	0–1				
RuB	Ruston fine sandy loam, nearly level phase	1–3	Well-drained upland soils that have fine sandy loam surface soil over sandy clay loam subsoil. Derived from unconsolidated beds of sand and sandy clays.	10	0 to 10	2.5 to 5.0
RuC	Ruston fine sandy loam, gently sloping phase.	3–8			10 to 39	0.8 to 2.5
RuC2	Ruston fine sandy loam, eroded gently sloping phase.	3–8			39 to 64	2.5 to 5.0

See footnote at end of table.

properties of the soils—Continued

Classification			Percentage passing sieve—			Structure	Reaction	Shrink-swell potential
USDA textural class	Unified	AASHO	No. 4	No. 10	No. 200			
							pH	
Very fine sandy loam.	SM	A-2-4		100	35 or less	Single grained	5.6 to 6.0	Low.
Sandy clay loam	ML to CL	A-4		100	62	Prismatic	7.9 to 8.5	Moderate.
Silty clay	CL	A-7-6		100	76	Prismatic	7.9 to 8.5	Moderate.
Clay	CL	A-6		100	70	Massive	7.9 to 8.5	Moderate.
Sand	SM	A-2-4		100	24	Single grained	7.9 to 8.5	Low.
Silt loam	ML	A-4		100	More than 35	Blocky	5.1 to 5.5	Low.
Silty clay	CL	A-6		100	More than 35	Subangular blocky	4.5 to 5.0	High.
Clay	CL	A-7-6		100	More than 35	Massive	4.5 to 5.0	High.
		Variable						
Silt loam	ML	A-4		100	More than 35	Blocky	5.1 to 5.5	Low.
Silty clay loam	ML to CL	A-4		100	More than 35	Blocky	4.5 to 5.0	Low (pan).
Clay to silty clay.	CL	A-6		100	More than 35	Massive	4.5 to 5.0	Moderate to high.
Fine sandy loam	SM	A-2-4		100	35 or less	Subangular blocky	5.6 to 6.0	Low.
Silt loam	ML	A-4		100	More than 35	Blocky	5.1 to 5.5	Low.
Silty clay	ML to CL	A-4		100	More than 35	Subangular blocky	5.1 to 5.5	Moderate.
Fine sandy loam	SM	A-2-4		100	35 or less	Granular or subangular blocky.	5.6 to 6.0	Low.
Sandy clay loam	SC	A-4		100	More than 35	Subangular blocky	5.6 to 6.0	Low to moderate.
Silt loam	ML	A-4		100	More than 35	Blocky	5.6 to 6.0	Low.
Silty clay loam	ML to CL	A-4		100	More than 35	Blocky	4.5 to 5.0	Moderate.
Silty clay	CL	A-6		100	More than 35	Blocky	4.5 to 5.0	Low to moderate.
Silty clay	CL	A-6		100	More than 35	Blocky	4.5 to 5.0	Moderate.
Very fine sandy loam.	SM	A-2-4		100	35 or less	Blocky	5.1 to 6.0	Low.
Sandy clay loam	SC	A-4		100	More than 35	Blocky	5.1 to 5.5	Low to moderate.
Sandy clay loam	SC	A-4		100	More than 35	Blocky	5.1 to 5.5	Low (pan).
Sandy clay loam	SC	A-4		100	More than 35	Blocky	5.1 to 5.5	Low to moderate.
Fine sandy loam	SM	A-2-4		100	35 or less	Granular to subangular blocky.	5.6 to 6.0	Low.
Sandy clay loam	SC	A-4		100	More than 35	Subangular blocky	5.6 to 6.0	Low to moderate.
Sandy loam	SM	A-2-4		100	35 or less	Single grained	5.6 to 6.0	Low.

TABLE 6.—*Estimated physical*

Map symbol	Soil name	Slope	Description	Depth to seasonally high water table	Depth from surface	Permeability [1]
		Percent		*Feet*	*Inches*	*Inches per hour*
RyC3	Ruston sandy clay loam, severely eroded gently sloping phase.	3–8				
RuD	Ruston fine sandy loam, sloping phase	8–12				
SaC	Saffell gravelly fine sandy loam, gently sloping phase.	3–8	Well-drained upland soils that have gravelly fine sandy loam surface soil over gravelly sandy clay loam. Derived from gravelly Forested Coastal Plain material.	10	0 to 28	2.5 to 5.0
SaC2	Saffell gravelly fine sandy loam, eroded gently sloping phase.	3–8			28 to 45	0.8 to 2.5
SaC3	Saffell gravelly fine sandy loam, severely eroded gently sloping phase.	3–8			45 to 58	5.0 to 10.0
SaD	Saffell gravelly fine sandy loam, sloping phase.	8–12				
SaD2	Saffell gravelly fine sandy loam, eroded sloping phase.	8–12				
SaE	Saffell gravelly fine sandy loam, 12 to 25 percent slopes.	12–25				
SdA	Savannah very fine sandy loam, level phase	0–1	Moderately well drained upland soils that have very fine sandy loam surface soil over sandy clay loam subsoil that contains a sandy clay loam fragipan. Substrata are unconsolidated beds of sand, silt, and sandy clay.	4	0 to 20	0.8 to 2.5
SdB	Savannah very fine sandy loam, nearly level phase.	1–3			20 to 36	0.2 to 0.8
SdB2	Savannah very fine sandy loam, eroded nearly level phase.	1–3			36 to 45 (pan).	0.05 to 0.2
SdC	Savannah very fine sandy loam, gently sloping phase.	3–8			45 to 72	0.2 to 0.8
SdC2	Savannah very fine sandy loam, eroded gently sloping phase.	3–8				
SdD	Savannah very fine sandy loam, sloping phase.	8–12				
SfA	Sawyer very fine sandy loam, level phase	0–1	Somewhat poorly drained upland soils that have very fine sandy loam surface soil over sandy clay and clay subsoil. Derived from unconsolidated beds of sand, silt, and clay.	6	0 to 8	0.8 to 2.5
SfB	Sawyer very fine sandy loam, nearly level phase.	1–3			8 to 18	0.2 to 0.8
SfB2	Sawyer very fine sandy loam, eroded nearly level phase.	1–3			18 to 27	0.05 to 0.2
SfC	Sawyer very fine sandy loam, gently sloping phase.	3–8			27 to 48	Less than 0.05.
SfC2	Sawyer very fine sandy loam, eroded gently sloping phase.	3–8				
SfE	Sawyer very fine sandy loam, moderately steep phase.	12–20				
ShB2	Shubuta fine sandy loam, eroded nearly level phase.	1–3	Moderately well drained upland soils that have fine sandy loam surface soil, which may be gravelly, over sandy clay or clay subsoil. Derived from unconsolidated beds of sand, silt, clay, or soft clay shale.	6	0 to 8	2.5 to 5.0
ShC2	Shubuta fine sandy loam, eroded gently sloping phase.	3–8			8 to 30	0.05 to 0.2
ShE	Shubuta gravelly fine sandy loam, moderately steep phase.	12–20			30 to 48	0.05 to 0.2
StA	Stough very fine sandy loam, level phase	0–1	Somewhat poorly drained stream terrace soils that have a very fine sandy loam surface soil over sandy clay loam subsoil that contains a sandy clay loam fragipan. Substrata are sediments washed from upland soils.	2	0 to 22	0.8 to 2.5
StB	Stough very fine sandy loam, nearly level phase.	1–3			22 to 28 (pan).	0.05 to 0.2
SK	Stough-Kalmia complex, mound phase	0–1			28 to 42	0.05 to 0.2
					42 to 64	0.05 to 0.2
WcA	Wilcox silty clay loam, level phase	0–1	Somewhat poorly drained upland soils that have a thin layer of silty clay loam over plastic clay. Derived from unconsolidated beds of silt, clay, and soft clay shale.	6	0 to 4	0.05 to 0.2
WcB	Wilcox silty clay loam, nearly level phase	1–3			4 to 50	Less than 0.05.
WcC	Wilcox silty clay loam, gently sloping phase	3–8				
WcC2	Wilcox silty clay loam, eroded gently sloping phase.	3–8				
WcE	Wilcox silty clay loam, moderately steep phase.	12–20				
WcF	Wilcox silty clay loam, steep phase	20+				

[1] Based on infiltration tests made with concentric rings on surface soil. Tests made by SCS in Arkansas from 1944 to 1954.

properties of the soils—Continued

Classification			Percentage passing sieve—			Structure	Reaction	Shrink-swell potential
USDA textural class	Unified	AASHO	No. 4	No. 10	No. 200			
							pH	
Gravelly fine sandy loam.	SM	A–1–b	80 or less	50 or less	25 or less	Single grained	5.1 to 6.0	Low.
Gravelly sandy clay loam.	SC	A–2–6	90 or less	65 or less	35 or less	Subangular blocky	5.1 to 5.5	Low to moderate.
Sand	SW	A–3		100	10 or less	Single grained	5.1 to 5.5	Low.
Very fine sandy loam.	ML	A–4		100	More than 35	Granular to blocky	5.1 to 6.0	Low.
Sandy clay loam	ML to CL	A–4		100	More than 35	Subangular blocky	5.1 to 5.5	Low to moderate.
Sandy clay loam	ML to CL	A–4		100	More than 35	Blocky	5.1 to 5.5	Low (pan).
Sandy clay loam	ML to CL	A–4		100	More than 35	Blocky	5.1 to 5.5	Low to moderate.
Very fine sandy loam.	SM	A–2–4		100	35 or less	Single grained to blocky.	5.1 to 6.0	Low.
Sandy clay loam	SC	A–4		100	More than 35	Blocky	4.5 to 5.0	Low to moderate.
Sandy clay	CL	A–7–6		100	More than 35	Blocky	4.5 to 5.0	Moderate to high.
Clay	CH	A–7–6		100	More than 35	Blocky	4.5 to 5.0	High.
Fine sandy loam	SM	A–2–4		100	35 or less	Single grained	5.6 to 6.0	Low.
Sandy clay	CL	A–7–6		100	More than 35	Blocky	5.1 to 5.5	Moderate to high.
Sandy clay to clay.	CL to CH	A–7–6		100	More than 35	Subangular blocky	5.1 to 5.5	Moderate to high.
Very fine sandy loam.	ML to CL	A–4		100	More than 35	Subangular blocky to blocky.	4.5 to 5.5	Low.
Sandy clay loam	ML to CL	A–4		100	More than 35	Blocky	4.5 to 5.0	Low (pan).
Sandy clay to sandy clay loam.	ML to CL	A–4		100	More than 35	Blocky	4.5 to 5.0	Moderate.
Sandy clay to clay.	CL	A–4		100	More than 35	Subangular blocky	4.5 to 5.0	Moderate to high.
Silty clay loam	ML to CL	A–4		100	More than 35	Subangular blocky	5.1 to 5.5	Moderate.
Clay	CL	A–7–6		100	More than 35	Massive to blocky	4.5 to 5.0	High.

TABLE 7.—*Engineering interpretation*

Soil series and map symbols	Suitability of soil material for—		Suitability as source of—		Adaptability to winter grading	Desirable location of grade line	Hydrologic soil group [1]
	Road subgrade	Road fill	Topsoil	Sand and gravel			
Bibb (Bb)	Poor	Poor	Poor	Poor	Poor because of frequent floods and high water table.	4 feet above high water mark.	D
Boswell (BgB, BgC, BgC2, BoC3, BwB, BwB2, BwC, BwC2, BwE)	Poor	Poor	Surface layer good, other layers poor.	Poor	Poor because of plastic clay subsoil.	Anywhere, if adequately drained.	D
Caddo and Tickfaw (CT)	Poor	Poor	Poor	Poor	Poor because of high water table.	4 feet above seasonally high water table.	C
Cahaba (CaB, CaC, CaC2, CaD)	Good	Good	Good	Medium; local areas good in substrata.	Good because well drained.	Anywhere	B
Chastain (Ch)	Poor	Poor	Poor	Poor	Poor because of frequent floods and plastic clay subsoil.	4 feet above high water mark.	D
Gullied land (Gu)				Variable materials			
Iuka-Mantachie (IM)	Poor	Surface layer good, other layers poor.	Surface layer good, other layers poor.	Poor	Fair because of occasional floods and high water table.	4 feet above high water mark.	B and C
Kalmia (KaB, KaC)	Good	Good	Good	Poor	Good because moderately well drained.	Anywhere	B
Lafe (La)	Poor	Poor	Poor	Poor	Poor because poorly drained in topsoil and subsoil.	4 feet above seasonally high water table.	D
Leaf (Le)	Poor	Poor	Poor	Poor	Poor because of plastic clay subsoil.	4 feet above seasonally high water table.	D
Mixed alluvial land (Ma)				Variable materials			
Myatt (Mb)	Poor	Poor	Poor	Poor	Poor because of high water table.	4 feet above seasonally high water table.	D and B

See footnote at end of table.

of soils in Bradley County

Tendency to slough or slide	Farm ponds		Soil features affecting suitability of the soil for—				
	Kind	Hazard	Artificial drainage	Sprinkler irrigation	Terraces and diversions	Building foundations	Sewage disposal fields
Moderate	Excavated	None	Seasonally high water table, floods, flat topography, and slow permeability.	High cost compared to benefits.	Not needed because of flat topography.	High water table, frequent floods.	High water table, frequent floods.
High	Impounded	Slow permeability, high erodibility.	Not needed because of sloping topography.	Shallowness over clay requires frequent applications.	High erodibility, high runoff potential.	Plastic clay subsoil that has a high shrink-swell potential.	Low percolation rate.
Moderate	Excavated	None	Seasonally high water table, flat topography, and slow permeability.	High cost compared to benefits.	Not needed because of flat topography.	High water table.	High water table, low percolation rate.
Low	Impounded	Local areas contain sand in substrata.	Not needed because of good natural drainage.	Favorable water-holding capacity, favorable rate of infiltration.	Erodibility	Stable and well-graded material.	High percolation rate.
High	Excavated	None	High water table, frequent floods, slow permeability.	High cost compared to benefits.	Not needed because of topography.	Plastic clay soil that has a high shrink-swell potential; floods.	Low percolation rate because of clay content.
Moderate	Excavated	None	High water table, frequent floods, moderate permeability.	Favorable water-holding capacity, favorable rate of infiltration, but irrigation seldom needed.	Not needed because of flat topography.	High water table, frequent floods.	High water table, floods.
Low	Impounded	Local areas contain sand substrata.	Not needed because of moderately good natural drainage.	Favorable water-holding capacity, favorable rate of infiltration.	Erodibility	Stable and moderately well drained material.	Moderate to high percolation rate.
High	None	Erodibility	Slow permeability, flat topography.	High cost compared to benefits.	Not needed because of flat topography.	Plastic clay subsoil, loose sand in substrata.	Low percolation rate.
High	Impounded	High erodibility.	Slow permeability, flat topography.	Low rate of infiltration, high cost compared to benefits.	Not needed because of flat topography.	Plastic clay subsoil that has a high shrink-swell potential.	Low percolation rate because of clay subsoil.
Moderate	Excavated	None	Seasonally high water table, flat topography, slow permeability.	High cost compared to benefits.	Not needed because of flat topography.	High water table.	High water table, low percolation rate.

TABLE 7.—*Engineering interpretation of*

Soil series and map symbols	Suitability of soil material for—		Suitability as source of—		Adaptability to winter grading	Desirable location of grade line	Hydrologic soil group [1]
	Road subgrade	Road fill	Topsoil	Sand and gravel			
Myatt-Kalmia (MK)	Poor	Poor	Poor	Poor	Poor because of high water table.	4 feet above seasonally high water table.	D and B
Ochlockonee (Oc)	Good	Good	Good	Poor	Fair because well drained, but has occasional floods.	4 feet above high water mark.	B
Orangeburg (OfC, OfC2, OfD, ORE)	Good	Good	Good	Medium; local areas good in substrata.	Good because well drained.	Anywhere	B
Pheba and Lewiston (PLA, PLB, PLB2)	Poor	Poor	Poor	Poor	Poor because somewhat poorly drained.	4 feet above seasonally high water table.	C
Prentiss (PrA, PrB, PrB2, PrC, PrC2, PrD, Ps, Ps2)	Good	Good	Surface layer good, other layers fair.	Poor	Good because moderately well drained.	4 feet above seasonally high water table.	C
Ruston (RuB, RuC, RuC2, RuD, RyC3)	Good	Good	Good	Medium; local areas good in substrata.	Good because well drained.	Anywhere	B
Saffell (SaC, SaC2, SaC3, SaD, SaD2, SaE)	Good	Good	Poor	Good	Good because well drained.	Anywhere	B
Savannah (SdA, SdB, SdB2, SdC, SdC2, SdD)	Good	Good	Surface layer good, other layers fair.	Poor	Good because moderately well drained.	4 feet above seasonally high water table.	C
Sawyer (SfA, SfB, SfB2, SfC, SfC2, SfE)	Poor	Fair from 0 to 24 inches.	Surface layer good, other layers poor.	Poor	Fair because somewhat poorly drained.	4 feet above seasonally high water table.	C
Shubuta (ShB2, ShC2, ShE)	Fair	Fair	Fair	Poor	Fair because moderately well drained.	4 feet above seasonally high water table.	C
Stough (SK, StA, StB)	Poor	Poor	Poor	Poor	Poor because somewhat poorly drained.	4 feet above seasonally high water table.	C

See footnote at end of table.

soils in Bradley County—Continued

Tendency to slough or slide	Farm ponds		Soil features affecting suitability of the soil for—				
	Kind	Hazard	Artificial drainage	Sprinkler irrigation	Terraces and diversions	Building foundations	Sewage disposal fields
Moderate	Excavated	None	Seasonally high water table, flat topography, slow permeability.	High cost compared to benefits.	Not needed because of flat topography.	High water table.	High water table, low percolation rate.
Low	Excavated	None	Not needed because of good natural drainage.	Favorable water-holding capacity, favorable rate of infiltration.	Not needed because of flat topography.	High water table.	Occasional floods.
Low	Impounded	Local areas contain sand substrata.	Not needed because of good natural drainage.	Favorable water-holding capacity, favorable rate of infiltration.	Erodibility	Stable and well-graded material.	High percolation rate.
Moderate	Impounded	Erodibility, fragipan in subsoil	Seasonally high water table.	High cost compared to benefits.	Not needed because of flat topography.	High water table.	High water table, moderate to low percolation rate.
Moderate	Impounded	Erodibility, fragipan in subsoil.	Not needed because of sloping topography.	Favorable water-holding capacity, favorable rate of infiltration until fragipan is reached.	Erodibility	Stable and moderately well drained material.	Moderate percolation rate.
Low	Impounded	Local areas contain sand substrata.	Not needed because of good natural drainage.	Favorable water-holding capacity, favorable rate of infiltration.	Erodibility	Stable and well-graded material.	High percolation rate.
Low	None	High gravel content.	Not needed because of good natural drainage.	High cost compared to benefit, low water-holding capacity, high rate of infiltration.	Erodibility	Stable and well-graded material.	High percolation rate.
Moderate	Impounded	Erodibility, fragipan in subsoil.	Not needed because of sloping topography.	Favorable water-holding capacity, favorable rate of infiltration until fragipan is reached.	Erodibility	Stable and moderately well drained material.	Moderate percolation rate.
High	Impounded	Slow permeability, high erodibility.	Not needed because of sloping topography.	Shallowness over clay requires frequent applications.	High erodibility, high runoff potential.	Clay subsoil that has high shrink-swell potential.	Low percolation rate.
High	Impounded	None	Not needed because of sloping topography.	Somewhat favorable water-holding capacity and rate of infiltration.	Erodibility	Fair suitability, deep to clay in substrata.	Moderate percolation rate.
Moderate	Impounded	Erodibility, fragipan in subsoil.	Seasonally high water table.	High cost compared to benefits.	Not needed because of flat topography.	High water table.	High water table, moderate to low percolation rate.

TABLE 7.—*Engineering interpretation of*

Soil series and map symbols	Suitability of soil material for—		Suitability as source of—		Adaptability to winter grading	Desirable location of grade line	Hydrologic soil group [1]
	Road subgrade	Road fill	Topsoil	Sand and gravel			
Wilcox (WcA, WcB, WcC, WcC2, WcE, WcF)	Poor	Poor	Poor	Poor	Poor because somewhat poorly drained.	Anywhere, if adequately drained.	D

[1] The soils are classified into four hydrologic soil groups according to the Soil Conservation Service Engineering Handbook, supplement A, section 4, on Hydrology. These groups are based on the intake of water at the end of long-lasting storms that occur after the soil is already wet and swelled, and when the soil is not protected by plants.

Group A contains deep sands that have very little silt and clay. It also includes deep and rapidly permeable loess. These soils soak up the most rainfall and lose the least in runoff.

silt loam to silty clay loam; it is gray mottled with brown. Productivity is low. Floods are frequent.

The Bibb soils are closely associated with the Chastain, Iuka, and Ochlockonee soils. They are less well drained than the Ochlockonee and Iuka soils and have a finer textured surface soil. Both the surface soil and the subsoil of the Bibb soils are coarser in texture than those of the Chastain soils.

Only one soil of the Bibb series was mapped in Bradley County. Areas of this soil are scattered over the county in level areas or in broad, shallow depressions in the bottom lands. A large area is in the western part of the county, near Moro Creek. The natural vegetation is hardwood forest that contains a few scattered pines. White oak, red oak, Nuttall oak, water oak, pin oak, beech, cypress, sweetbay, and loblolly pine are the most common species.

Bibb silt loam (Bb) (0 to 1 percent slopes) (Capability unit Vw-1).—This gray soil of the bottom lands has poor drainage and a high water table, and it is frequently overflowed.

Profile in moist woodland (NW¼SW¼ sec. 13, T. 14 S., R. 10 W.):

A_0 ½ to 0 inch, dark-gray (10YR 4/1), partly decomposed forest litter.

A_{1g} 0 to 8 inches, gray (10YR 6/1) silt loam that has a few fine, faint, brown (10YR 5/3) mottles; weak, medium, angular blocky structure; friable; contains many small pores, many small to large roots, and a few small, soft, dark concretions; strongly acid; diffuse boundary.

A_{2g} 8 to 28 inches, gray (10YR 6/1) silt loam that has many fine, faint, yellowish-brown (10YR 5/4) mottles; weak, medium, angular blocky structure; firm but friable; contains many small pores, small roots, and soft, dark concretions; very strongly acid; diffuse boundary.

C_{1g} 28 to 48 inches +, light-gray (10YR 7/1) silty clay loam that has a few fine, faint, brown (10YR 5/3) mottles; moderate, medium, angular blocky structure; slightly plastic; contains many small pores and many small roots; small to large, soft, dark concretions are common; very strongly acid.

The predominant color of the surface soil is light gray or gray. The color of the mottles ranges through shades of brown and yellow. The color of the subsoil is similar to that of the surface soil. The subsoil texture ranges from silt loam to, in a few places, clay. A few small areas of Bibb very fine sandy loam, Bibb fine sandy loam, and Mantachie silt loam are included in this mapping unit.

This soil is low in organic matter. The natural productivity is low. The reaction is strongly acid. Runoff is very slow, and the permeability of the subsoil is slow. The capacity for holding available moisture is moderate.

Use and suitability.—Most of this soil has always been in woodland. Some areas are used fairly successfully for summer pasture. Excess water on and in this soil limits its use.

Boswell Series

The Boswell series consists of moderately well drained, medium acid to strongly acid soils. They were derived from unconsolidated beds of clay, silt, sand, and, in some places, soft clay shale.

The surface soil ranges from very fine sandy loam to gravelly fine sandy loam in texture. Its color is dark grayish brown to grayish brown. The subsoil is red to yellowish-red, plastic clay. Very plastic clay, variegated in red, brown, and gray, begins at a depth of about 18 to 21 inches.

These soils have slow permeability and slow internal drainage. They are highly susceptible to erosion.

The Boswell soils are associated with the Wilcox, Shubuta, and Sawyer soils. They are better drained than the Wilcox soils, and they have a redder subsoil. The subsoil of the Boswell soils is finer textured than that of the Sawyer soils.

These soils occur on nearly level to moderately steep uplands in the northern half of Bradley County. Most of the acreage is covered with the native vegetation of pines and hardwoods. Shortleaf pine, loblolly pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum are common species.

Boswell very fine sandy loam, gently sloping phase (BwC) (3 to 8 percent slopes) (Capability unit IIIe-3).—This is a moderately well drained, highly erodible soil that has a subsoil of red plastic clay.

soils in Bradley County—Continued

Tendency to slough or slide	Farm ponds		Soil features affecting suitability of the soil for—				
	Kind	Hazard	Artificial drainage	Sprinkler irrigation	Terraces and diversions	Building foundations	Sewage disposal fields
High	Impounded	Erodibility	Generally not needed because of slope; permeability.	High cost compared to benefits.	Erodibility, difficulties caused by plastic clay subsoil.	Plastic clay that has a high shrink-swell potential.	Low percolation rate.

Group B contains soils that are mostly sandy and less deep than the soils in group A. It also contains loess that is less deep or less well aggregated than the soils in group A. Soils in this group absorb more water than average, even after they are thoroughly wet.
Group C consists of shallow soils and soils that contain large amounts of clay and colloidal particles, but not so much as the soils in group D. Soils in group C allow less water than average to soak in after the soil is thoroughly wet.
Group D consists mostly of clays that increase greatly in volume when they absorb water. This group also includes some shallow soils that have nearly impermeable layers near the surface. Soils in group D soak up the least rainfall and lose the most in runoff.

Profile in a moist pasture (SW¼NW¼ sec. 4, T. 12 S., R. 10 W.):

A_1 0 to 3 inches, dark grayish-brown (10YR 4/2) very fine sandy loam; single grained; friable; roots are common; contains a few pieces of gravel; medium acid; clear, smooth boundary.

A_2 3 to 10 inches, yellowish-brown (10YR 5/6) very fine sandy loam; weak, medium, subangular blocky structure; friable; roots and fine pores are common; contains a few pieces of gravel; medium acid; abrupt, smooth boundary.

B_2 10 to 18 inches, red (2.5YR 4/6) clay; strong, medium, blocky structure; plastic; roots and fine pores are common; contains a few pieces of gravel; medium acid; gradual, smooth boundary.

C 18 to 72 inches, clay that is variegated in colors of red, brown, and gray; moderate, medium, subangular blocky structure; very plastic; medium acid.

Where this soil is cultivated, the surface layer is yellowish brown and ranges in thickness from 6 to 10 inches. The B horizon ranges in color from red to yellowish red and in thickness from 8 to 20 inches. Small areas that have a surface texture of fine sandy loam or gravelly fine sandy loam are included in this mapping unit.

This soil has only a small supply of organic matter. Its natural fertility is low. It is medium acid in reaction. Runoff is medium to rapid. The subsoil is slowly permeable. The available moisture holding capacity is moderate. The plow layer has good tilth.

Use and suitability.—Most of this soil has always been in woodland. Much of the acreage that was formerly used for crops has reverted to pines and hardwoods.

This soil is of limited use because of its red plastic clay subsoil. It is productive of loblolly pine and shortleaf pine. If properly fertilized, it is fairly well suited to cotton, corn, small grains, and pasture.

Boswell very fine sandy loam, nearly level phase (BwB) (1 to 3 percent slopes) (Capability unit IIe-2).—This soil is less erodible than Boswell very fine sandy loam, gently sloping phase.

Use and suitability.—The greater part of this soil is in woodland. The natural vegetation is a mixture of pines and hardwood trees. Small areas are cultivated or in pasture.

This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected from erosion, it is fairly well suited to cotton, corn, small grains, and pasture.

Boswell very fine sandy loam, eroded nearly level phase (BwB2) (1 to 3 percent slopes) (Capability unit IIIe-3).—This soil is like Boswell very fine sandy loam, gently sloping phase, except for the effects of erosion. The surface soil consists of about 3 to 5 inches of yellowish-brown very fine sandy loam. In a few places the red clay of the subsoil is exposed. The hazard of further erosion is less serious than on the gently sloping phase.

Use and suitability.—The greater part of this soil is cultivated or has been cultivated in the past. Small areas are used for pasture.

This soil is productive of loblolly pine and shortleaf pine. It is fairly well suited to cotton, corn, small grains, and pasture, if properly fertilized.

Boswell very fine sandy loam, eroded gently sloping phase (BwC2) (3 to 8 percent slopes) (Capability unit IIIe-3).—This soil has a thinner surface soil than the uneroded gently sloping phase, and it loses more water through runoff.

Use and suitability.—Most of this soil was cultivated at one time. A large acreage has now reverted to woodland by natural reseeding or has been replanted with pine seedlings. If properly fertilized and protected from erosion, this soil is fairly well suited to cotton, corn, small grains, and pasture.

Boswell sandy clay, severely eroded gently sloping phase (BoC3) (3 to 8 percent slopes) (Capability unit IVe-3).—The plow layer of this soil consists of firm, reddish-brown sandy clay, which is a mixture of the original fine sandy loam surface soil and the underlying red clay subsoil. Infiltration is slower and runoff is more rapid than on Boswell very fine sandy loam, gently sloping phase. The plow layer has poor tilth.

Use and suitability.—Most of this soil was formerly cultivated, but it is now in woodland. Some has reverted to pines and hardwood trees by natural reseeding, and some has been replanted with pine seedlings. Woodland is the most suitable use for this soil.

Boswell very fine sandy loam, 8 to 20 percent slopes (BwE) (Capability unit VIIe-2).—This soil is like Boswell

TABLE 8.—*Approximate acreage and proportionate extent of the soils*

Mapping unit	Area	Extent
	Acres	*Percent*
Bibb silt loam	72, 145	17. 4
Boswell very fine sandy loam, nearly level phase	1, 039	. 2
Boswell very fine sandy loam, eroded nearly level phase	634	. 2
Boswell very fine sandy loam, gently sloping phase	1, 612	. 4
Boswell very fine sandy loam, eroded gently sloping phase	1, 019	. 2
Boswell sandy clay, severely eroded gently sloping phase	272	. 1
Boswell very fine sandy loam, 8 to 20 percent slopes	1, 262	. 3
Boswell gravelly fine sandy loam, nearly level phase	374	. 1
Boswell gravelly fine sandy loam, gently sloping phase	1, 512	. 4
Boswell gravelly fine sandy loam, eroded gently sloping phase	1, 296	. 3
Caddo and Tickfaw silt loams	38, 978	9. 4
Cahaba sandy loam, nearly level phase	939	. 2
Cahaba sandy loam, gently sloping phase	1, 381	. 3
Cahaba sandy loam, eroded gently sloping phase	1, 915	. 5
Cahaba sandy loam, sloping phase	161	(1)
Chastain silty clay	22, 558	5. 4
Gullied land	432	. 1
Iuka-Mantachie silt loams	4, 919	. 12
Kalmia fine sandy loam, nearly level low terrace phase	2, 054	. 5
Kalmia fine sandy loam, gently sloping low terrace phase	1, 269	. 3
Lafe very fine sandy loam	654	. 2
Leaf silt loam	785	. 2
Mixed alluvial land	28, 358	6. 8
Myatt silt loam	43, 028	10. 4
Myatt-Kalmia complex, mound phase	16, 888	4. 1
Ochlockonee fine sandy loam	14, 804	3. 6
Orangeburg fine sandy loam, gently sloping phase	328	. 1
Orangeburg fine sandy loam, eroded gently sloping phase	752	. 2
Orangeburg fine sandy loam, sloping phase	243	. 1
Orangeburg and Ruston fine sandy loams, moderately steep phases	142	(1)
Pheba and Lewiston soils, level phases	13, 005	3. 1
Pheba and Lewiston soils, nearly level phases	4, 905	1. 2
Pheba and Lewiston soils, eroded nearly level phases	595	. 1
Prentiss very fine sandy loam, level phase	1, 528	. 4
Prentiss very fine sandy loam, nearly level phase	4, 012	1. 0
Prentiss very fine sandy loam, eroded nearly level phase	2, 739	. 7
Prentiss very fine sandy loam, gently sloping phase	468	. 1
Prentiss very fine sandy loam, eroded gently sloping phase	477	. 1
Prentiss very fine sandy loam, sloping phase	258	. 1
Prentiss very fine sandy loam, mound phase	2, 071	0. 5
Prentiss very fine sandy loam, eroded mound phase	734	. 2
Ruston fine sandy loam, nearly level phase	439	. 1
Ruston fine sandy loam, gently sloping phase	2, 202	. 5
Ruston fine sandy loam, eroded gently sloping phase	7, 203	1. 7
Ruston sandy clay loam, severely eroded gently sloping phase	214	(1)
Ruston fine sandy loam, sloping phase	544	. 1
Saffell gravelly fine sandy loam, gently sloping phase	5, 616	1. 4
Saffell gravelly fine sandy loam, eroded gently sloping phase	13, 682	3. 3
Saffell gravelly fine sandy loam, severely eroded gently sloping phase	460	. 1
Saffell gravelly fine sandy loam, sloping phase	1, 397	. 3
Saffell gravelly fine sandy loam, eroded sloping phase	1, 419	. 3
Saffell gravelly fine sandy loam, 12 to 25 percent slopes	511	. 1
Savannah very fine sandy loam, level phase	2, 924	. 7
Savannah very fine sandy loam, nearly level phase	15, 936	3. 8
Savannah very fine sandy loam, eroded nearly level phase	12, 632	3. 0
Savannah very fine sandy loam, gently sloping phase	1, 877	. 4
Savannah very fine sandy loam, eroded gently sloping phase	3, 704	. 9
Savannah very fine sandy loam, sloping phase	279	. 1
Sawyer very fine sandy loam, level phase	1, 401	. 3
Sawyer very fine sandy loam, nearly level phase	3, 067	. 7
Sawyer very fine sandy loam, eroded nearly level phase	2, 463	. 6
Sawyer very fine sandy loam, gently sloping phase	1, 110	. 3
Sawyer very fine sandy loam, eroded gently sloping phase	1, 645	. 4
Sawyer very fine sandy loam, moderately steep phase	262	. 1
Shubuta fine sandy loam, eroded nearly level phase	420	. 1
Shubuta fine sandy loam, eroded gently sloping phase	472	. 1
Shubuta gravelly fine sandy loam, moderately steep phase	387	. 1
Stough very fine sandy loam, level phase	5, 607	1. 3
Stough very fine sandy loam, nearly level phase	3, 785	. 9
Stough-Kalmia complex, mound phase	12, 889	3. 1
Wilcox silty clay loam, level phase	4, 447	1. 1
Wilcox silty clay loam, nearly level phase	2, 532	. 6
Wilcox silty clay loam, gently sloping phase	1, 989	. 5
Wilcox silty clay loam, eroded gently sloping phase	1, 275	. 3
Wilcox silty clay loam, moderately steep phase	4, 404	1. 1
Wilcox silty clay loam, steep phase	3, 621	. 9
Total	415, 360	100. 0

[1] Less than 1/10 of 1 percent. All other figures rounded to nearest tenth of 1 percent.

very fine sandy loam, gently sloping phase, except that runoff is more rapid and the hazard of erosion is greater.

Use and suitability.—Most of this soil has always been in woodland of pines and hardwoods. A few small areas are used for pasture. Those areas that have been cleared are now being returned to woodland, either by natural reseeding or by replanting with pine seedlings.

This soil is not suited to clean-tilled crops, because of its steep slopes and the hazard of erosion. Woodland is its most suitable use.

Boswell gravelly fine sandy loam, nearly level phase (BgB) (1 to 3 percent slopes) (Capability unit IIe-2).—The uppermost 8 to 10 inches of this soil contains many pieces of chert and gravel less than 1 inch in diameter. The

upper part of the subsoil also contains a few pieces of gravel. The gravel in the plow layer makes tillage slightly difficult.

Use and suitability.—Most of this soil is in woodland of hardwoods and pines. It is productive of loblolly pine and shortleaf pine. If properly fertilized and protected from erosion, it is fairly well suited to cotton, corn, small grains, and pasture.

Boswell gravelly fine sandy loam, gently sloping phase (BgC) (3 to 8 percent slopes) (Capability unit IIIe-3).—Many pieces of chert and quartz gravel less than 1 inch in diameter are scattered through the uppermost 8 to 10 inches of this soil. A few pieces of gravel are in the upper part of the subsoil. The gravel makes tillage slightly difficult.

Use and suitability.—Most of this soil is covered by pines and hardwood trees. It is a productive soil for loblolly pine and shortleaf pine. It is fairly well suited to cotton, corn, small grains, and pasture, if it is properly fertilized and if good erosion control practices are established.

Boswell gravelly fine sandy loam, eroded gently sloping phase (BgC2) (3 to 8 percent slopes) (Capability unit IIIe-3).—This soil has a thinner surface soil than Boswell very fine sandy loam, gently sloping phase, and the surface soil contains many small pieces of chert and quartz gravel less than 1 inch in diameter. The upper part of the subsoil also contains a few pieces of gravel. The soil is slightly difficult to till because of the gravel.

Use and suitability.—Most of this soil has been under cultivation, but a large acreage has now reverted to woodland by natural reseeding or has been replanted with pine seedlings.

If properly fertilized and protected from erosion, this soil is fairly well suited to cotton, corn, small grains, and pasture.

Caddo Series

The Caddo series consists of poorly drained, medium acid to strongly acid soils of the uplands. They were derived from unconsolidated beds of sand, silt, and silty clay.

The surface soil is silt to fine sandy loam; it is dark grayish brown to gray and mottled in various shades of brown. The subsoil is silt loam to silty clay loam and is gray mottled with brown.

These soils are poorly drained and slowly permeable. They are droughty in the summer.

The Caddo soils in Bradley County were mapped with the Tickfaw soils in one undifferentiated mapping unit. The soils of the two series are similar, except that the Tickfaw soil has a heavier substratum. They are associated with the Savannah, Pheba, and Lewiston soils. The Caddo soils are grayer, more poorly drained, and finer textured than the associated soils, and they lack the compact horizon that the Savannah, Pheba, and Lewiston soils all have.

These soils are extensive in level areas in the northern two-thirds of the county. The native vegetation of pines and hardwood trees covers most of the area. Common woodland species are loblolly pine, shortleaf pine, post oak, red oak, water oak, blackgum, and sweetgum.

Caddo and Tickfaw silt loams (CT) 0 to 1 percent slopes) (Capability unit IIIw-1).—This mapping unit consists mostly of Caddo silt loam. These are mottled, gray soils on level parts of the uplands. They have poor drainage and a high water table.

Profile of Caddo silt loam in moist woodland (SE¼-NE¼ sec. 21, T. 14 S., R. 10 W.):

A_1 0 to 3 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine and medium, subangular blocky structure; very friable; contains numerous roots and a few pieces of fine quartz gravel; strongly acid; clear, wavy boundary.

A_{2g} 3 to 13 inches, gray (10YR 6/1) heavy silt loam that has a few yellowish-brown spots associated with broken soft concretions; weak, coarse, subangular blocky structure; very friable; roots are common; medium-sized hard concretions with black interior are common; contains a few pieces of fine quartz gravel; very strongly acid; gradual, wavy boundary, with a few tongues into the horizon below.

B_{2g} 13 to 27 inches, gray (10YR 6/1) silt loam, about 10 percent of which is in coarse, yellowish-brown mottles that extend through the aggregates; massive in place, but breaks readily to fine, angular blocky fragments; friable; contains a few roots and numerous fine pores; contains many medium and coarse, hard concretions up to 2 inches in diameter and black internally; contains a few pieces of fine quartz gravel; very strongly acid; diffuse, wavy boundary.

B_{3g} 27 to 45 inches, gray (10YR 6/1) silt loam in which coarse, light yellowish-brown (10YR 6/4) mottles are common; coarse, angular blocky structure that breaks readily to fine, angular blocky structure; somewhat friable, though tough and compact in places; contains numerous pores and a few fine roots; contains many hard concretions up to ½ inch in diameter and black internally; contains a few pieces of fine quartz gravel; very strongly acid.

In most places the surface soil is silt loam, but small areas of silt, very fine sandy loam, and fine sandy loam are included. Some areas have mounds on the surface. In some places the B horizon is silty clay loam; in others it is sandy clay loam. The sizes and the numbers of mottles and concretions vary from one place to another.

Profile of Tickfaw silt loam in moist woodland (SE¼-NE¼ sec. 30, T. 13 S., R. 9 W.):

A_0 1 to 0 inch, dark-gray, partly decomposed leaf mold.

A_1 0 to 2 inches, very dark brown (10YR 2/2) silt loam; weak, fine, granular structure; friable; contains many fine roots and a few dark, soft concretions; strongly acid; clear, abrupt boundary.

A_2 2 to 6 inches, gray (10YR 5/1) silt loam that has fine, faint, dark grayish-brown (10YR 4/2) mottles; weak, medium, subangular blocky structure; friable; contains many fine roots and a few dark, soft concretions; strongly acid; clear, wavy boundary.

B_1 6 to 18 inches, silty clay loam mottled with gray (10YR 5/1), light yellowish brown (10YR 6/4), and lighter shades of gray; moderate, medium, subangular blocky structure; contains a few fine roots and dark concretions; strongly acid; gradual, wavy boundary.

B_2 18 to 28 inches, silty clay mottled with gray (10YR 6/1), light yellowish brown (10YR 6/4), and brown (10YR 5/3); moderate, medium, subangular blocky structure; plastic; contains a few small dark concretions; strongly acid; diffuse boundary.

C 28 to 40 inches +, clay mottled with gray (10YR 6/1), yellowish brown (10YR 5/4), and pale brown (10YR 6/3); massive; very plastic; contains a few soft, dark concretions; strongly acid.

The surface soil is dominantly silt loam. It ranges in color from light gray to very dark brown. The subsoil is silty clay or silty clay loam mottled in various shades of gray, brown, and yellow. The substratum is also mottled in gray, brown, and yellow. Its texture ranges from plastic clay to silty clay.

These soils contain little organic matter. They are medium acid to strongly acid. Runoff is very slow, and the subsoils have very slow permeability. The available moisture holding capacity is low. The plow layer has poor tilth. Productivity is low.

Use and suitability.—These soils are mostly in woodland of pine and hardwood trees. Some of the acreage was formerly cropped, but it has been returned to woodland or used for pasture.

These soils are productive of loblolly pine and shortleaf pine. If they are properly fertilized and the surface is drained, they are fairly well suited to small grains and pasture.

Cahaba Series

The Cahaba series consists of well-drained, medium acid to strongly acid soils on stream terraces. They were derived from old alluvium that washed from the Ruston, Shubuta, and Orangeburg soils on the uplands.

The surface soil is sandy loam that ranges in color from dark grayish brown to brown. The subsoil is sandy clay loam to sandy clay that is yellowish red to reddish brown in color.

Both internal drainage and surface drainage are good. Permeability is moderate. Tilth is good.

The Cahaba soils are associated with the Kalmia and Prentiss soils. They are better drained than the associated soils and are more red and less yellow in the subsoil. There is no compact layer like that in the subsoil of the Prentiss soils.

Most of the Cahaba soils are scattered in small areas in the southern part of the county. They are on nearly level to gently sloping areas near all the larger streams. The natural vegetation is loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum. Most of the acreage has been cleared and is now cultivated.

Cahaba sandy loam, gently sloping phase (CaC) (3 to 8 percent slopes) (Capability unit IIIe-1).—This is a deep, well-drained, productive soil on sandy stream terraces.

Profile in moist grassland (SW¼SW¼ sec. 16, T. 16 S., R. 11 W.):

A_{1p} 0 to 1 inch, dark grayish-brown (10YR 4/2) fine sandy loam; single grained; very friable; roots are common; medium acid; smooth boundary.

A_{2p} 1 to 12 inches, brown (10YR 5/3) fine sandy loam; weak, medium, granular structure; very friable; contains many fine roots, many fine pores, and small, dark, soft concretions; medium acid; clear, smooth boundary.

B_1 12 to 20 inches, yellowish-red (5YR 5/6) sandy loam; weak, fine, angular blocky structure; friable; contains many small roots, many small pores, and a few soft, dark concretions; strongly acid; diffuse boundary.

B_2 20 to 40 inches, yellowish-red (5YR 4/8) sandy clay loam; moderate, medium, angular blocky structure; friable; contains a few fine roots and a few fine pores; strongly acid; irregular boundary.

C 40 to 52 inches, yellowish-red (5YR 5/8) sandy loam that has a few large, prominent mottles of brown (7.5YR 5/4); weak, medium to coarse, angular blocky structure; friable; contains a few fine roots and a few fine pores; strongly acid.

The surface soil ranges in color from dark grayish brown to brown, in thickness from 10 to 18 inches, and in texture from very fine sandy loam to loamy sand. The subsoil ranges in color from reddish brown to yellowish red and in texture from sandy loam to sandy clay loam. In some places the C horizon is uniform in color, and in others it is mottled with various shades of red and brown. Its texture ranges from sand to sandy clay.

This soil contains a moderate to large amount of organic matter. The reaction is medium acid. Runoff is medium, permeability is moderate, and the available moisture holding capacity is moderate. Productivity is medium to high. The plow layer has good tilth.

Use and suitability.—Most of this soil is cultivated or in pasture. If left in woodland, it is productive of loblolly pine and shortleaf pine. When properly fertilized and protected against erosion, it is well suited to all crops common in the county, especially early crops and pasture.

Cahaba sandy loam, nearly level phase (CaB) (1 to 3 percent slopes) (Capability unit IIe-3).—Runoff is slower and the erosion hazard is less severe on this soil than on Cahaba sandy loam, gently sloping phase.

Use and suitability.—Most of this soil is cultivated. Small areas are used for woodland and pasture. The soil is productive of loblolly pine and shortleaf pine. It is well suited to all crops grown in the county, especially early crops and pasture, but it needs proper fertilization and control of erosion.

Cahaba sandy loam, eroded gently sloping phase (CaC2) (3 to 8 percent slopes) (Capability unit IIIe-1).—The surface layer of this soil is thinner than that of Cahaba sandy loam, gently sloping phase. In some spots the surface is reddish because subsoil is mixed with the surface soil. Water runs off more rapidly and infiltrates more slowly than on the gently sloping phase.

Use and suitability.—Small areas are used for woodland and for pasture, but most of this soil is cultivated. It is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected from further erosion, it is well suited to all crops and pasture plants common in the county.

Cahaba sandy loam, sloping phase (CaD) (8 to 12 percent slopes) (Capability unit IVe-1).—Runoff is more rapid and the hazard of erosion is greater on this soil than on Cahaba sandy loam, gently sloping phase.

Use and suitability.—Most of this soil is in woodland. It is productive of loblolly pine, shortleaf pine, and hardwood trees. If erosion is carefully controlled and enough fertilizer is used, this soil is fairly well suited to small grains and pasture.

Chastain Series

The Chastain series consists of poorly drained, strongly acid soils that developed in recent alluvium. The surface soil is very dark gray to gray in color and fine in texture. The subsoil is gray clay mottled with brown, red, and yellow.

Permeability is very slow, and internal drainage is

slow. Floods are frequent, and water stands on the surface for long periods.

The Chastain soils are associated with the Bibb and Ochlockonee soils. They are finer textured throughout their profiles than either. They are not so well drained as the Ochlockonee soils.

The Chastain soils are extensive in the southern part of the county along the Ouachita and Saline Rivers. They lie on level areas or in slight depressions.

These soils have been left in woodland of native hardwoods. Nuttall oak, pin oak, water oak, post oak, haw, hickory, wild pecan, and cypress are common species.

Chastain silty clay (Ch) (0 to 1 percent slopes) (Capability unit Vw-1).—This is a gray, poorly drained soil on the bottom land along the Ouachita and Saline Rivers. The water table is high. Floods are frequent, and in winter and spring the soil is under water for as long as a month at a time.

Profile in moist woodland (SE¼SW¼ sec. 34, T. 12 S., R. 9 W.):

A_1 0 to 2 inches, very dark gray (10YR 3/1) silty clay; moderate, fine, subangular blocky structure; plastic; contains many small roots; strongly acid; clear boundary.

C_{1g} 2 to 10 inches, gray (10YR 5/1) clay that has many faint, fine mottles of light yellowish brown (10YR 6/4); moderate, fine to medium, subangular blocky structure; very plastic; contains a few fine roots and a few fine pores; very strongly acid; gradual boundary.

C_{2g} 10 to 42 inches +, light-gray (10YR 7/1) clay that has a few distinct, fine, reddish-brown (2.5YR 5/4) and brown (10YR 5/3) mottles; massive; very strongly acid.

The color of the surface soil ranges from very dark gray to gray. The color of the subsoil is predominantly gray, but it is mottled with various shades of brown, red, and yellow. The mottles vary in size.

Included are areas of Mantachie soils, Chastain silty clay loam, Chastain silt loam, and Chastain clay that are too small to be mapped separately.

Use and suitability.—This soil has always been in woodland. It has been cut over and now supports a very poor growth of hardwood trees.

Gullied Land

This land type consists of small areas of soils that have been converted by erosion into a network of gullies. The soils were mostly of the Ruston, Orangeburg, Boswell, Wilcox, Shubuta, Saffell, and Savannah series. Only a small acreage of this land type was mapped. It is in the northern half of the county.

Gullied land (Gu) (3 to 20 percent slopes) (Capability unit VIIe-1).—In most areas of this land type, the surface soil has been removed, and an intricate pattern of gullies of various depths and sizes has developed. The exposed soil material varies in texture and consistence, depending on what the uneroded soil was like.

Use and suitability.—This land has been used intensively in the past, but severe erosion has destroyed its usefulness. The surface is too rough to allow the use of ordinary farm machinery. Most of the acreage is now idle or is reverting to woodland by natural reseeding. The areas are best suited to woodland or to wildlife shelter.

Iuka Series

Soils of the Iuka series are moderately well drained, medium acid to strongly acid soils that were derived from recent alluvium on bottom lands.

The surface soil is silt loam that ranges from dark brown to dark gray in color. The silty clay loam subsoil is brown to depths of 20 or 30 inches, below which it is mottled gray and brown. The depth to the mottling ranges from 20 to 30 inches. In some places, stratified layers of clay or sandy clay are present at depths of more than 16 inches.

The Iuka soils were so closely intermingled with the Mantachie soils that soils of the two series were mapped as a complex. This complex of dark-brown, moderately well drained Iuka soils and dark-brown to dark-gray, somewhat poorly drained Mantachie soils is associated with the well-drained Ochlockonee soils and the gray, very poorly drained Bibb soils.

The Iuka soils are scattered over the county on level areas on the flood plains of the larger streams. The natural vegetation—hardwood trees and a few scattered pines—covers most of the acreage. Nuttall oak, water oak, white oak, willow, beech, holly, hickory, ironwood, maple, sweetgum, cypress, and loblolly pine are some of the more common species.

Iuka-Mantachie silt loams (IM) (0 to 1 percent slopes) (Capability unit I-1).—These are moderately well drained to somewhat poorly drained soils on bottom lands. They are productive, but their use is somewhat limited by occasional overflow.

Profile of Iuka silt loam in moist woodland (NW¼SW¼ sec. 10, T.16 S., R. 10 W.):

A_0 1 to 0 inch, dark-gray, partly decomposed leaf mold.

A_1 0 to 15 inches, dark-brown (10YR 4/3) silt loam; weak, medium to coarse, subangular blocky structure; friable; contains many fine roots, many fine pores, and a few fine, soft, dark concretions; medium acid; gradual boundary.

C_1 15 to 30 inches, brown (10YR 5/3) silty clay loam; weak, medium, angular blocky structure; friable; contains a few fine roots, a few pores, and a few fine, soft, dark concretions; very strongly acid; clear, wavy boundary.

C_2 30 to 48 inches +, silty clay loam that has many fine to coarse, distinct mottles of gray (10YR 6/1), yellowish brown (10YR 5/8), and very dark gray (10YR 3/1); moderate to strong, medium, angular blocky structure; friable but slightly compact; contains a few fine pores and many dark concretions less than 1 inch in diameter; very strongly acid.

The color of the surface soil ranges from dark brown to dark gray. The depth to the mottled horizon ranges from 12 to 30 inches, and its texture ranges from silty clay loam to clay. This horizon contains stratified layers of clay or sandy clay in some places.

Profile of Mantachie silt loam in moist woodland (SE¼NE¼ sec. 2, T. 13 S., R. 9 W.):

A_0 1 to 0 inch, dark-gray, partly decomposed leaf mold.

A_1 0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium, subangular blocky structure; friable; contains many fine roots, many fine pores, and a few fine, soft, dark concretions; medium acid; gradual boundary.

C_1 8 to 22 inches, silty clay loam that has many fine to coarse, distinct mottles of gray (10YR 4/1), yellowish brown (10YR 5/4), and dark gray (10YR 4/1); moderate to strong, medium, angular blocky structure; friable but slightly compact; contains a few fine pores and a few small, soft, dark concretions; very strongly acid; gradual boundary.

C_2 22 to 45 inches +, mottled light-gray (10YR 7/1), brown (10YR 5/3), and dark-gray (10YR 4/1) silty clay loam or silty clay; moderate to strong, medium, angular blocky structure; slightly plastic; contains a few fine pores and soft, dark concretions; very strongly acid.

The surface soil ranges from dark brown to dark gray in color. The mottled horizon is 6 to 12 inches below the surface. It ranges from silty clay loam to clay in texture. In some places it contains stratified layers of clay or pockets of sandy clay.

The soils in this complex have a medium to large supply of organic matter, and their reaction is medium acid to strongly acid. Runoff is slow, the subsoil is slowly permeable, and the available moisture holding capacity is high. The tilth of the plow layer is good.

Use and suitability.—Most of this complex has always been in woodland. Of the acreage that was formerly cropped, much is now being used for pasture. These soils are well suited to pasture and a wide range of cultivated crops.

Kalmia Series

The Kalmia series consists of moderately well drained, medium acid to strongly acid soils on stream terraces. The alluvium from which they were derived was washed from upland soils, such as those of the Ruston, Shubuta, and Savannah series.

The surface soil is dark-brown to yellowish-brown fine sandy loam, and the subsoil is yellowish-brown to brown sandy clay loam to sandy loam. The lower part of the subsoil is mottled with gray and various shades of brown.

These soils have good drainage. They are moderately permeable. Tilth is good.

The Kalmia soils are associated with the Cahaba, Prentiss, and Myatt soils. They are not so well drained as the Cahaba soils, and they do not have a red subsoil. They are better drained and coarser textured than the Prentiss and Myatt soils. They lack the panlike subsoil layer that is characteristic of the Prentiss soils.

These soils occupy small, nearly level to gently sloping areas. They occur near all the larger streams. The native vegetation consisted of pines and hardwoods. Some common woodland species were loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, blackgum, and coastal chinquapin (*12*). Most of the acreage has been cleared and cultivated.

Kalmia fine sandy loam, nearly level low terrace phase (KaB) (1 to 3 percent slopes) (Capability unit IIe–3).—This is a deep, moderately well drained, productive soil.

Profile in a moist cultivated field (SE¼NE¼ sec. 14, T. 13 S., R. 9 W.):

A_{1p} 0 to 5 inches, dark-brown (10YR 4/3) fine sandy loam; single grained; very friable; contains many fine roots; medium acid; clear boundary.

A_2 5 to 10 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; single grained; friable; contains a few fine roots and a few soft, dark concretions; strongly acid; gradual boundary.

B_2 10 to 24 inches, yellowish-brown (10YR 5/4) sandy clay loam; weak, medium, angular blocky structure; friable when moist, slightly plastic when wet; contains a few fine roots, a few fine pores, and very small, soft, dark concretions; strongly acid; gradual boundary.

C_1 24 to 47 inches +, yellowish-brown (10YR 5/6) sandy clay loam that has faint mottles of brown (10YR 5/3), brownish yellow (10YR 6/8), and light brownish gray (10YR 6/2); weak, medium, angular blocky structure; friable when moist, slightly plastic when wet; contains a few fine pores and soft, dark concretions; strongly acid.

The thickness of the A horizon ranges from 8 to 20 inches, and its texture ranges from very fine sandy loam to fine sandy loam. Small areas have a surface texture of loamy sand. The B horizon is uniform in color, but its texture ranges from sandy clay loam to sandy loam. The C horizon covers a wide range of mottled colors of brown, yellow, and gray. In some places it contains thin, stratified layers of clay to sandy clay loam.

Some small areas of Izagora soils are included in this mapping unit. The Izagora soils are not mapped separately in Bradley County.

The content of organic matter in this soil is medium to large. The reaction is strongly acid. Runoff is medium, and the permeability of the subsoil is moderate. The available moisture holding capacity is moderate. Natural fertility is medium to high. The plow layer has good tilth.

Use and suitability.—Most of this soil is cultivated. Small areas are in woodland and pasture. This soil is productive of loblolly pine and shortleaf pine. When it is properly fertilized, it is well suited to most pasture plants and to all row crops common in the county.

Kalmia fine sandy loam, gently sloping low terrace phase (KaC) (3 to 8 percent slopes) (Capability unit IIIe–1).—The surface layer of this soil is thinner and more likely to erode than that of Kalmia fine sandy loam, nearly level low terrace phase.

Use and suitability.—Most of this soil has been in cultivation at some time. Some of it has now reverted to woodland or is being used for pasture. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is well suited to all of the row crops commonly grown in the county and to most pasture plants.

Lafe Series

The soils of the Lafe series are very poorly drained, slightly acid to moderately alkaline soils on terraces. Most of their parent material came from fine-textured soils on the uplands.

The surface soil is dark grayish-brown very fine sandy loam to silt loam. The subsoil is clay and is mottled in various shades of brown and gray. Concretions of calcium carbonate are numerous throughout the profile.

The Lafe soils are closely associated with the Myatt soils. The Lafe surface soil is thinner, and the Myatt soils do not have a plastic clay subsoil like that of the Lafe soils.

Two areas of Lafe soils, locally known as the Prairies, are mapped on the terraces of the Saline River south of Warren. The topography is level to depressed. Circular mounds from 50 to 100 feet in diameter and 3 to 4 feet high occupy more than 20 percent of the surface. The plastic subsoil layer is constant in elevation.

The natural vegetation is a sparse cover of three-awn grass and annual lespedeza. Stunted loblolly pine and post oak grow on the mounds and around the edges of

the soil areas. Little use is made of this soil, except for some grazing in the spring.

Lafe very fine sandy loam (La) (0 to 1 percent slopes) (Capability unit VIIs-1).—This is a very poorly drained, alkaline soil on stream terraces.

Profile in moist grassland (SW¼SE¼ sec. 13, T. 13 S., R. 9 W.):

A_1 0 to 4 inches, dark grayish-brown (10YR 4/2) very fine sandy loam; single grained to very weak granular structure; friable; contains a few roots; fine, hard, black concretions are common; medium acid; clear, smooth boundary.

B_{21ca} 4 to 13 inches, grayish-brown (2.5Y 5/2) sandy clay loam, in which fine gray and brown mottles are common; weak, fine, prismatic structure; firm when moist, very hard when dry; many dark-brown calcium carbonate concretions; moderately alkaline; gradual, wavy boundary.

B_{22ca} 13 to 30 inches, silty clay variegated in colors of yellowish brown (10YR 5/8) and gray (10YR 6/1); weak, fine, prismatic structure; plastic when moist, very hard when dry; many dark-brown calcium carbonate concretions; moderately alkaline; clear, wavy boundary.

C 30 to 52 inches, yellowish-brown (10YR 5/6) clay in which coarse mottles or pockets of gray sandy clay are common; massive; very plastic when moist, extremely hard when dry; moderately alkaline; clear, smooth boundary.

D 52 to 70 inches, white (10YR 8/1) sand that contains a few fine streaks or mottles of brown; single grained; loose; moderately alkaline.

The surface soil ranges from 1 to 8 inches in thickness. The texture is very fine sandy loam in most places, but it is silt loam in small areas. The depth to the accumulations of calcium carbonate concretions in the subsoil ranges from 4 to more than 18 inches. The depth to the sandy D horizon is 36 inches or more.

This soil contains little organic matter. It is slightly acid to moderately alkaline in reaction. Runoff is slow, and permeability is very slow.

Use and suitability.—This soil is of limited use because of alkalinity and poor drainage. All of it is now idle. It provides a little grazing early in the spring.

Leaf Series

The soils of the Leaf series are poorly drained and medium acid to strongly acid. They have developed on stream terraces from old alluvium that washed from the Wilcox, Boswell, and Shubuta soils on the uplands.

The surface soil is gray to very dark gray silt to very fine sandy loam. The subsoil is clay. It is mottled in various shades of gray, brown, and red.

These soils have slow internal drainage and slow permeability. Productivity is low.

The Leaf soils are associated with the Myatt and Prentiss soils. They are finer textured than either. They are more poorly drained than the Prentiss soils.

The small acreage of the Leaf soils is scattered over the southern half of the county in small, level to nearly level areas near the larger streams. Most of the acreage is covered by the native vegetation of loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, blackgum, and other hardwoods.

Leaf silt loam (Le) (0 to 1 percent slopes) (Capability unit IIIw-1).—This is a poorly drained soil that has a mottled plastic clay subsoil. It lies on stream terraces.

Profile in moist woodland (NE¼NE¼ sec. 18, T. 13 S., R. 11 W.):

A_1 0 to 4 inches, gray (10YR 5/1) silt loam; moderate, medium, angular blocky structure; friable; contains many small roots, many fine pores, and a few very small pieces of chert and quartz gravel; strongly acid; diffuse boundary.

B_{1g} 4 to 16 inches, gray (10YR 5/1) silty clay that has a few faint, fine, yellowish-brown (10YR 5/4) mottles; moderate, medium, subangular blocky structure; plastic; contains a few fine roots, a few fine pores, and a few very small pieces of chert and quartz gravel; very strongly acid; gradual boundary.

C 16 to 42 inches +, clay mottled with gray (10YR 5/1), yellowish brown (10YR 5/4), and red (2.5YR 4/6); massive; contains a few fine roots, a few fine pores, and a few very small pieces of gravel; very strongly acid.

The A horizon is from 3 to 6 inches thick. Its color ranges from gray to very dark gray, and its texture from silt loam to very fine sandy loam. Small areas that have a silty clay loam surface soil are included in this unit.

This soil is low in natural fertility. The supply of organic matter is small. The reaction is medium acid to strongly acid. Runoff is rapid, and the permeability of the subsoil is slow. The available moisture holding capacity is high. The plow layer has poor tilth.

Use and suitability.—Most of this soil has always been in woodland, but a few small areas are used for pasture. The soil is productive of loblolly pine and shortleaf pine. If properly fertilized, it is fairly well suited to cotton, small grains, peas, and pasture.

Lewiston Series

The Lewiston series consists of somewhat poorly drained, medium acid to strongly acid soils. They developed in a thin mantle of loess, or windblown silt, over unconsolidated beds of sand, silt, and silty clay.

The surface soil is gray to pale-brown silt loam. The gray to yellowish-brown subsoil is mottled with various shades of brown. The texture of the subsoil is silty clay loam to silty clay.

Internal drainage is slow, and permeability is slow. Productivity is low.

In Bradley County, the Lewiston soils have been mapped only in undifferentiated units with the Pheba soils. The Pheba soils are like the Lewiston soils, except that their parent material had no layer of loess over it. The mapping units in which the Lewiston soils appear are listed under the Pheba series. A detailed profile of a Lewiston soil is described under the first of those units.

The Pheba and Lewiston mapping units are associated with Caddo, Tickfaw, and Savannah soils. The Lewiston soils are better drained than the Caddo and Tickfaw soils and have a browner subsoil. The compact layer in the subsoil is less distinct than that in the Savannah soils, and the mottles extend through the entire subsoil.

The Lewiston soils are on level to nearly level parts of the uplands. Most of the acreage is covered with native woodland. Loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum are the most common trees.

Mantachie Series

The soils of the Mantachie series are moderately well drained, medium acid to strongly acid soils that were derived from recent alluvium on bottom lands.

The surface soil is dark-brown silt loam, and the subsoil is yellowish-brown silt loam to silty clay loam. The subsoil is mottled with gray, beginning 8 to 20 inches below the surface.

In Bradley County, the Mantachie soils have been mapped only in a complex with the Iuka soils, because the soils of these two series are so intermingled that they could not be separated on the map. A description of this complex, including a detailed profile of Mantachie silt loam, can be found under the Iuka series. The Mantachie soils are more poorly drained than the Iuka soils. The complex is associated with the well-drained Ochlockonee and the very poorly drained Bibb soils.

The Mantachie soils are on level areas on the flood plains of all of the larger streams. They support a native forest of hardwood trees and a few scattered pines. The most common species are Nuttall oak, water oak, white oak, willow, beech, holly, hickory, ironwood, maple, sweetgum, cypress, and some loblolly pine.

Mixed Alluvial Land

This miscellaneous land type consists of various kinds of soils and soil materials on the first bottoms of small streams throughout the county.

Mixed alluvial land (Ma) (0 to 1 percent slopes) (Capability unit Vw-1).—The soil material in this land type varies in texture from clay to sand and gravel. Drainage ranges from good to poor. The reaction is medium acid to strongly acid. The areas are frequently flooded, both in winter and in summer.

Use and suitability.—Most of this land type is in woodland. Most of the trees are hardwoods, but there are some loblolly pines and shortleaf pines. A few acres are used for pasture. These soils and soil materials are fairly well suited to most pasture plants.

Myatt Series

The Myatt series consists of poorly drained, medium acid to strongly acid soils. They were developed on stream terraces from alluvium washed from the Ruston, Savannah, and Orangeburg soils on the uplands.

These soils have a dark-gray to gray surface soil that ranges in texture through silt, silt loam, and very fine sandy loam. The subsoil is gray to pale-brown silt loam to silty clay mottled with shades of brown.

Permeability is slow, internal drainage is slow, and runoff is slow.

These soils are associated with the Prentiss and Stough soils. They have poorer drainage, finer texture, and a grayer surface soil than either. The Prentiss soils have a yellowish-brown subsoil.

Extensive acreages of the Myatt soils occur on the terraces near the larger streams. Native woodland covers most of the acreage. The most common species are water oak, red oak, soft maple, sweetgum, ash, hickory, cypress, loblolly pine, and shortleaf pine.

Myatt silt loam (Mb) (0 to 1 percent slopes) (Capability unit IIIw-1).—This mottled gray soil has poor drainage and a high water table.

Profile in moist woodland (NW¼NW¼ sec. 12, T. 16 S., R. 12 W.):

A_g 0 to 8 inches, gray (10YR 6/1) silt loam that has a few fine, yellowish-brown (10YR 5/4) mottles; massive, but crushes readily to fine to medium, angular blocky fragments; friable; contains many fine and medium roots and a few fine pores; strongly acid; gradual, smooth boundary.

B_{1g} 8 to 25 inches, gray (10YR 6/1) silt loam that has a few fine and medium, yellowish-brown (10YR 5/4) mottles; massive, but breaks readily to fine, angular blocky fragments; hard when dry, very friable when moist; contains numerous fine and medium roots, numerous fine and medium pores, and a few medium, hard, black concretions; strongly acid; clear, wavy boundary.

B_{2g} 25 to 35 inches, pale-brown (10YR 6/3) heavy silty clay loam in which medium-sized mottles of yellowish-brown (10YR 5/4) tough silty clay loam or silty clay are common; massive in place, but can be dug out in moderate, coarse, angular blocky fragments that break into fine, angular blocky structure; some coarse vertical cracks; firm when moist, plastic when wet; fine and medium roots are common; aggregates contain numerous fine and medium pores; few, medium and coarse, hard concretions that are black inside; very strongly acid; gradual, smooth boundary.

C_{1g} 35 to 49 inches, gray (10YR 6/1) clay that has a few medium and coarse, yellowish-brown (10YR 5/6) mottles; massive; firm when moist, plastic when wet; contains a few fine, hard concretions and a few roots; very strongly acid; gradual, wavy boundary.

C_{2g} 49 to 58 inches +, grayish-brown (10YR 5.5/2) silty clay that has many fine and medium, yellowish-brown (10YR 5/4) mottles; massive and tough, but can be dug out in coarse clods that break to fine and medium, angular fragments; tough, firm, and plastic; contains a few root hairs; clods contain a few pores; horizon contains a few balls of clay 3 inches in diameter and enclosing cores of silt loam; no hard concretions were observed; extremely acid.

The A horizon is 6 to 10 inches thick. In most places it is silt loam, but in others it is silt or very fine sandy loam. It ranges in color from dark gray to gray and has a few faint mottles of brown. The B horizon ranges in texture from silt loam to silty clay. It ranges in color from light gray to pale brown and has numerous mottles of various shades of brown. The C horizon ranges from silty clay loam to clay. It varies widely in structure and consistence.

This soil is low in productivity. It contains little organic matter. The reaction is medium acid to strongly acid. Runoff is slow, and the soil is slowly permeable. The available moisture holding capacity is low.

Use and suitability.—Most of the acreage has always been in woodland. A few small areas are in pasture. This soil is productive of loblolly pine and shortleaf pine. After it is drained, it is fairly well suited to small grains and pasture.

Myatt-Kalmia complex, mound phase (MK) (0 to 1 percent slopes) (Capability unit IIIw-1).—This complex consists of mounds of Kalmia soils and, between the mounds, areas of Myatt silt loam. There is no set pattern in height, diameter, or number of the mounds. They range from 50 to 130 feet in diameter and from 2 to 4 feet in height and occupy more than 20 percent of the surface.

Use and suitability.—Most of the acreage has always been in woodland of pines and hardwood trees. A few

small areas are used for pasture. This soil is productive of loblolly pine and shortleaf pine. It is fairly well suited to small grains and pasture.

Ochlockonee Series

The Ochlockonee series consists of well-drained, medium acid to strongly acid soils. They were derived from recent alluvium.

The surface soil is dark-brown silt loam to fine sandy loam. The subsoil is yellowish-brown fine sandy loam to silty clay loam. Between depths of 30 and 50 inches the soil is mottled with gray.

These soils have good drainage and moderate permeability. Some areas are flooded in winter and spring. Productivity is good.

The Ochlockonee soils are closely associated with the Iuka, Bibb, and Chastain soils. Their drainage is better than that of the other soils, and their subsoil is browner and coarser textured.

Only one Ochlockonee soil was mapped in Bradley County. It occupies level to undulating bottom lands beside most of the larger streams. The native vegetation is hardwood trees and a few scattered pines. Nuttall oak, pin oak, water oak, white oak, maple, hickory, ash, and ironwood are common, and there is some loblolly pine.

Ochlockonee fine sandy loam (Oc) (0 to 1 percent slopes) (Capability unit I–1).—This brown, well-drained soil on bottom lands is the most productive in the county.

Profile in a moist pasture (SE¼NE¼ sec. 25, T. 12 S., R. 10 W.):

A_1 0 to 8 inches, dark-brown (10YR 4/3) fine sandy loam; weak, fine, subangular blocky structure; very friable; contains many small roots and many fine pores; medium acid; diffuse boundary.

C_1 8 to 50 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, medium, angular blocky structure; friable; contains a few fine roots and a few fine pores; strongly acid; irregular boundary.

C_2 50 to 63 inches +, silty clay loam to very fine sandy loam that has many fine, faint mottles of brown (10YR 5/3), yellowish brown (10YR 5/8), and gray (10YR 5/1); weak, medium, subangular blocky structure; contains a few small, soft, dark concretions; strongly acid.

Where cultivated, the surface soil is brown. The C horizon ranges in color from brown to yellowish brown and in texture from fine sandy loam to silty clay loam. The number of mottles varies from one place to another, and the depth to mottling ranges from 30 to 50 inches. Small areas of silt loam and very fine sandy loam are included in this mapping unit.

This soil contains a large amount of organic matter. The reaction is medium acid. Runoff is medium, the permeability of the subsoil is moderate, and the available moisture holding capacity is moderate. Productivity is high. The plow layer has good tilth. Some areas are occasionally flooded.

Use and suitability.—This is the most extensively cultivated bottom-land soil in the county. Most of the acreage has always been in woodland. A large part formerly cropped is now used for pasture. This soil is well suited to loblolly pine and to all cultivated crops and pasture plants that are grown in the county.

Orangeburg Series

The Orangeburg series consists of well-drained, medium acid soils that were derived from unconsolidated beds of sand, silt, and sandy clay. The surface soil is brown to grayish brown, and the subsoil consists of red to yellowish-red sandy clay loam.

Both surface drainage and internal drainage are good. Permeability is moderate. Tilth is good.

These soils are associated with the Ruston and Shubuta soils. They have coarser textured subsoils than either. Their surface soil is thicker and their subsoil is redder than those of the Ruston soils.

Most of these soils are in the northwestern part of the county on high ridgetops. The slopes range from nearly level to moderately steep. The acreage is small, and most of it has been cultivated. Some has since reverted to the native vegetation of loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, blackgum, and coastal chinquapin (*12*).

Orangeburg fine sandy loam, eroded gently sloping phase (OfC2) (3 to 8 percent slopes) (Capability unit IIIe–1).—This is a deep, well-drained, productive soil.

Profile in moist woodland (SE¼SE¼ sec. 14, T. 12 S., R. 12 W.):

A_1 0 to 2 inches, grayish-brown (10YR 5/2) fine sandy loam; weak, granular structure; very friable; contains many roots; medium acid; gradual, smooth boundary.

A_2 2 to 12 inches, strong-brown (7.5YR 5/6) fine sandy loam; weak, medium, subangular blocky structure; friable; contains many roots and many fine pores; medium acid; clear, smooth boundary.

B_2 12 to 72 inches, red (2.5YR 4/8) sandy clay loam; weak, medium, subangular blocky structure; firm when moist, slightly plastic when wet; contains many fine pores and a few roots; medium acid; gradual, wavy boundary.

C 72 to 90 inches +, red (2.5YR 4/6) sandy clay loam, in which medium-sized, brown and yellowish-red mottles and streaks are common; strong, medium, subangular blocky structure; firm when moist, slightly plastic when wet; contains many fine pores and a few roots; medium acid.

The surface soil ranges from 10 to 20 inches in thickness. It is lighter colored in cultivated fields than in woodland. The B horizon ranges in thickness from 2 to 6 feet. The C horizon ranges in texture from sandy clay loam to sand. In some places it is streaked or mottled with various shades of brown and gray. Small areas of loamy sand are included in this unit.

This soil contains a moderate amount of organic matter. The reaction is medium acid. Runoff is medium to slow, and the subsoil is moderately permeable. The available moisture holding capacity is moderate. Fertility is moderate, and tilth is good.

Use and suitability.—Most of the acreage is cultivated. Small areas are in woodland and pasture. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected from erosion, it is well suited to cotton, corn, small grains, vegetables, tomatoes, and most pasture plants. It is a good soil for early crops.

Orangeburg fine sandy loam, gently sloping phase (OfC) (3 to 8 percent slopes) (Capability unit IIIe–1).—The surface layer of this soil is thicker than that of Orangeburg fine sandy loam, eroded gently sloping phase, and it contains more organic matter.

Use and suitability.—This soil is now in woodland. It is productive of loblolly pine and shortleaf pine. If

it is properly fertilized and protected against erosion, it is well suited to all of the row crops and most of the pasture plants grown in the county.

Orangeburg fine sandy loam, sloping phase (OfD) (8 to 12 percent slopes) (Capability unit IVe–1).—This soil is less eroded than Orangeburg fine sandy loam, eroded gently sloping phase, although its erosion hazard is greater and runoff is more rapid.

Use and suitability.—Most of this soil is in woodland. It is productive of loblolly pine and shortleaf pine. If fertilized and protected against erosion, it is fairly well suited to small grains and pasture.

Orangeburg and Ruston fine sandy loams, moderately steep phases (ORE) (12 to 20 percent slopes) (Capability unit VIe–1).—This mapping unit consists of areas of Orangeburg soils and Ruston soils too small to separate on the map. On these soils, the hazard of erosion is greater than on Orangeburg fine sandy loam, eroded gently sloping phase, because runoff is more rapid and infiltration is slower.

Use and suitability.—Some of the acreage in this unit was formerly cultivated, but all of it is now in pasture or woodland. These soils are productive of loblolly pine and shortleaf pine and are fairly well suited to pasture.

Pheba Series

The Pheba series consists of somewhat poorly drained, medium acid to strongly acid soils developed in unconsolidated beds of sand, silt, and silty clay. The surface soil is dark-gray to pale-brown very fine sandy loam to silt loam. The subsoil is gray to yellowish-brown silty clay loam to silty clay mottled with various shades of brown.

These soils are slowly permeable. Internal drainage is slow. Productivity is low.

The Pheba soils have been mapped in Bradley County only in undifferentiated mapping units with the Lewiston soils. The soils of the two series were derived from the same kind of parent material, except that the upper part of the Lewiston soils formed from a thin mantle of loess, or windblown silt, that was deposited over the Coastal Plain material.

The mapping units that contain the Pheba soils are associated with soils of the Caddo, Tickfaw, and Savannah series. The Pheba soils have better drainage and browner subsoils than the Caddo and Tickfaw soils. The compact layer in the Savannah soils is more distinct than that in the Pheba soils, and part of the subsoil of the Savannah is free of mottling.

These soils occupy level to nearly level parts of the uplands. Native woodland of loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum covers most of the acreage.

Pheba and Lewiston soils, nearly level phases (PLB) (1 to 3 percent slopes) (Capability unit IIw–1).—These mottled gray and brown soils have poor drainage and a high water table.

Profile of Pheba very fine sandy loam in a moist wooded area (SW¼NW¼ sec. 32, T. 13 S., R. 10 W.):

A_0 1 to 0 inch, dark-gray, partly decomposed leaf mold.
A_1 0 to 2 inches, grayish-brown (10YR 5/2) very fine sandy loam; weak, fine, angular blocky structure; very friable; contains many fine roots and pores, a few small soft dark concretions, and a few small pieces of quartz gravel; medium acid; clear boundary.
A_2 2 to 10 inches, pale-brown (10YR 6/3) very fine sandy loam; few, faint, fine mottles of gray (10YR 6/1) and yellowish-brown (10YR 5/4); weak, fine to medium, angular blocky structure; very friable; contains many fine roots and pores, a few fine soft dark concretions, and a few small pieces of quartz gravel; medium acid; diffuse boundary.
B_2 10 to 20 inches, yellowish-brown (10YR 5/6) sandy clay loam; few, faint, fine mottles of gray (10YR 6/1) and brown (10YR 5/3); weak, medium, angular blocky structure; friable; contains a few fine roots and pores, and a few small pieces of quartz gravel; medium acid; gradual, smooth boundary.
B_{3m} 20 to 30 inches, sandy clay loam; fine to medium mottles of gray (10YR 6/1), brown (10YR 5/3), and yellowish brown (10YR 5/8); medium to moderate, strong, angular blocky structure; firm; contains a few fine pores, soft dark concretions, and small pieces of quartz gravel; strongly acid; gradual, irregular boundary.
C 30 to 42 inches +, gray (10YR 6/1) sandy clay loam; medium, distinct mottles of brown (10YR 5/3) and yellowish brown (10YR 5/8); medium, moderate, angular blocky structure; friable; contains a few fine pores, soft dark concretions, and small pieces of quartz gravel; strongly acid.

The surface soil ranges from very fine sandy loam to silt loam and is 6 to 10 inches thick. Its color ranges from dark gray to pale brown. The subsoil ranges in color from gray to yellowish brown and has a few or many mottles of different sizes and various shades of brown. The subsoil texture ranges from sandy clay loam to silty clay loam. The compact layer is irregular in thickness. It lies from 18 to 36 inches below the surface.

Profile of Lewiston silt loam in a moist wooded area (NW¼SE¼ sec. 29, T. 12 S., R. 10 W.):

A_0 ½ to 0 inch, dark-gray, partly decomposed leaf mold.
A_1 0 to 2 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; contains many roots and small, dark concretions; medium acid; clear boundary.
A_2 2 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; contains many roots and small, dark concretions; strongly acid; abrupt boundary.
B_2 7 to 18 inches, yellowish-brown (10YR 5/4) silty clay loam that has many fine to medium, distinct mottles of gray (10YR 6/1) and brown (10YR 5/3); moderate, medium, subangular blocky structure; friable; contains many roots and a few soft, dark concretions; strongly acid; gradual, irregular boundary.
B_{3m} 18 to 36 inches, silty clay loam that has many fine to medium, distinct mottles of yellowish brown (10YR 5/4), gray (10YR 6/1), and brown (10YR 5/3); moderate, medium, subangular blocky structure; firm; strongly acid; gradual, wavy boundary.
C 36 to 42 inches +, silty clay that is mottled in light yellowish brown (10YR 6/4), gray (10YR 6/1), and brown (10YR 5/3); moderate, medium to coarse, subangular blocky structure; friable; strongly acid.

The surface soil ranges from gray to brown. It is 6 to 10 inches thick. The subsoil is gray to brown and is mottled in various shades of brown and gray. There may be only a few mottles or many of them, and they vary in size. The subsoil texture ranges from silty clay loam to silty clay. The firm or compact layer is 15 to 36 inches below the surface.

The Pheba and Lewiston soils in this mapping unit contain little organic matter. Their reaction is medium acid. Runoff is slow to medium, subsoil permeability is slow, and the available moisture holding capacity is moderate. Productivity is low, and tilth is poor.

Use and suitability.—A large acreage of these soils has always been in native woodland. Small areas are used for row crops and pasture. These soils are productive of loblolly pine and shortleaf pine. If properly fertilized, they are fairly well suited to cotton, corn, small grains, and pasture.

Pheba and Lewiston soils, level phases (PLA) (0 to 1 percent slopes) (Capability unit IIw–1).—Runoff from these soils is slower than from Pheba and Lewiston soils, nearly level phases.

Use and suitability.—Pines and hardwood trees have always covered a large acreage of these soils. Small areas are in row crops and pasture. These soils are productive of loblolly pine and shortleaf pine. After proper fertilization, they are fairly well suited to cotton, corn, small grains, and pasture.

Pheba and Lewiston soils, eroded nearly level phases (PLB2) (1 to 3 percent slopes) (Capability unit IIw–1).—In this mapping unit, the surface soil is thinner than in Pheba and Lewiston soils, nearly level phases. Runoff is somewhat more rapid.

Use and suitability.—A large acreage of these soils is cultivated. Small areas are in woodland and pasture. These soils are productive of loblolly pine and shortleaf pine. If properly fertilized and protected from erosion, they are fairly well suited to cotton, corn, small grains, and pasture.

Prentiss Series

The Prentiss series consists of moderately well drained, medium acid to strongly acid soils on stream terraces. They were derived from sediments that washed from Ruston, Shubuta, and Savannah soils of the uplands.

The surface soil ranges from silt loam to fine sandy loam and is dark grayish brown to light brownish gray. The yellow to yellowish-brown subsoil ranges from silty clay loam to sandy clay loam. The subsoil contains a pan layer that begins 20 to 36 inches below the surface.

Surface drainage is good. Internal drainage is moderate to slow. Productivity is good, and tilth is good.

The Prentiss soils are associated with the better drained Cahaba soils and the less well drained Stough and Myatt soils. The Cahaba soils have a reddish-brown subsoil and lack a pan layer. The Stough and Myatt soils have mottled subsoils.

The Prentiss soils are on nearly level to moderately sloping areas on the higher terraces of streams. A large acreage is cultivated or in pasture; other large areas are in native woodland. Common trees are loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum.

Prentiss very fine sandy loam, gently sloping phase (PrC) (3 to 8 percent slopes) (Capability unit IIIe–2).—This is a deep, moderately well drained, productive soil on stream terraces.

Profile in moist woodland (NW¼SW¼ sec. 27, T. 16 S., R. 10 W.):

A_0 1 to 0 inch, very dark gray (10YR 3/1), partly decomposed leaf mold.

A_1 0 to 8 inches, dark grayish-brown (10YR 4/2) very fine sandy loam; weak, medium, angular blocky structure; friable; contains numerous small roots, numerous small pores, and a few small, hard, dark concretions; medium acid; clear, smooth boundary.

B_1 8 to 15 inches, yellowish-brown (10YR 5/8) very fine sandy loam; weak, medium, angular blocky structure; friable; slightly sticky when wet; contains many small roots, many small pores, and a few hard, dark concretions up to one-half inch in diameter; strongly acid; diffuse boundary.

B_2 15 to 25 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, medium, angular blocky structure; friable; contains many small roots, many small pores, and a few hard, dark concretions up to one-half inch in diameter; strongly acid; clear, wavy boundary.

B_{3m} 25 to 36 inches, sandy clay loam in which fine, distinct mottles of gray (10YR 5/1), yellowish brown (10YR 5/8), and yellow (10YR 7/6) are common; moderate, medium, angular blocky structure; compact, but breaks easily into a friable mass; contains many large, hard, dark concretions up to 3 inches in diameter; strongly acid; gradual, wavy boundary.

C 36 to 52 inches +, yellowish-brown (10YR 5/8) sandy clay loam that has a few fine, faint mottles of gray, red, and brown; moderate, medium, angular blocky structure; friable; contains a few hard concretions less than 1 inch in diameter; strongly acid.

The A horizon is 8 to 14 inches thick. It ranges from dark gray to grayish brown in color and from silt loam to fine sandy loam in texture. The depth to the mottled horizon ranges from 20 to 36 inches, and the horizon itself is 10 to 18 inches thick. The mottled horizon has the characteristics of a pan formation, but the panlike characteristics are more strongly developed in some places than in others. The texture of the C horizon ranges from silty clay loam to sandy clay loam. The color is yellowish brown, mottled with various shades of gray, red, and brown. The mottles vary in size.

Small areas of Tilden fine sandy loam have been included in this mapping unit. The Tilden soils are not mapped separately in Bradley County.

This soil has a large supply of organic matter. The reaction is medium acid. Runoff is medium, and the permeability of the subsoil is moderate to slow. The available moisture holding capacity is moderate. The natural productivity is high, and the plow layer has good tilth.

Use and suitability.—Most of the acreage is in native woodland of pines and hardwood trees. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected from erosion, it is well suited to cotton, corn, small grains, peas, and vegetables, and to most pasture plants.

Prentiss very fine sandy loam, level phase (PrA) (0 to 1 percent slopes) (Capability unit I–2).—Runoff is slower on this soil than on Prentiss very fine sandy loam, gently sloping phase. There is very little hazard of erosion.

Use and suitability.—A large acreage of this soil is cultivated or in pasture. The soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized, it is well suited to all crops and pasture plants grown in the county.

Prentiss very fine sandy loam, nearly level phase (PrB) (1 to 3 percent slopes) (Capability unit IIe–1).—This soil has slower runoff and less hazard of erosion than does Prentiss very fine sandy loam, gently sloping phase.

Use and suitability.—A large acreage is in native pines and hardwood trees. Some areas are cultivated or used for pasture. This soil is productive of loblolly pine and shortleaf pine. It is well suited to all row crops and

pasture plants common in the county, but it must be properly fertilized and protected against erosion.

Prentiss very fine sandy loam, eroded nearly level phase (PrB2) (1 to 3 percent slopes) (Capability unit IIe–1).—Runoff is slower and the erosion hazard less serious on this soil than on Prentiss very fine sandy loam, gently sloping phase.

Use and suitability.—A large acreage of this soil is cultivated or in pasture. Some that was cultivated has reverted to woodland by natural reseeding or has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is well suited to all of the row crops and pasture plants grown in the county.

Prentiss very fine sandy loam, eroded gently sloping phase (PrC2) (3 to 8 percent slopes) (Capability unit IIIe–2).—The surface soil of this mapping unit is thinner than that of Prentiss very fine sandy loam, gently sloping phase. Runoff is more rapid, and the rate of infiltration is slower.

Use and suitability.—Most of this soil has been cultivated at one time. Some has reverted to woodland by natural reseeding or has been replanted with pine seedlings. This is a productive soil for loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is well suited to all of the row crops and pasture plants grown in the county.

Prentiss very fine sandy loam, sloping phase (PrD) (8 to 12 percent slopes) (Capability unit IVe–2).—Runoff is more rapid and the erosion hazard is greater on this soil than on Prentiss very fine sandy loam, gently sloping phase.

Use and suitability.—Most of this soil has been cultivated in the past, but a large part has reverted to woodland by natural reseeding or has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected against erosion, it is good for pasture, and fair for small grains and legumes.

Prentiss very fine sandy loam, mound phase (Ps) (0 to 1 percent slopes) (Capability unit IIIe–2).—This soil has slower runoff and less hazard of erosion than Prentiss very fine sandy loam, gently sloping phase. Mounds are scattered irregularly over the surface. These mounds range from 2 to 4 feet in height and from 50 to 130 feet in diameter and occupy more than 20 percent of the surface. The pan layer is constant in elevation.

Use and suitability.—A large acreage is in native pines and hardwood trees. Some areas are cultivated or used for pasture. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is well suited to all row crops and pasture plants grown in the county.

Prentiss very fine sandy loam, eroded mound phase (Ps2) (0 to 1 percent slopes) (Capability unit IIe–2).—The surface soil of this soil is thinner than that of Prentiss very fine sandy loam, gently sloping phase. Mounds are scattered in an irregular pattern and occupy more than 20 percent of the surface; they range from 50 to 130 feet in diameter and from 2 to 4 feet in height. The pan layer is constant in elevation.

Use and suitability.—Most of this acreage is in the native vegetation of hardwood trees and pines. The soil is productive of loblolly pine and shortleaf pine. It is well suited to row crops and pasture plants, if properly fertilized and protected from erosion.

Ruston Series

The Ruston series consists of well-drained, medium acid soils that were derived from unconsolidated beds of sand, silt, and sandy clay. The surface soil is grayish-brown to yellowish-brown sandy loam. The subsoil is reddish-yellow to yellowish-red sandy clay loam.

These soils have good surface drainage and good internal drainage. Permeability is moderate. Tilth is good.

The Ruston soils are associated with soils of the Orangeburg, Saffell, and Savannah series. They are better drained than the Savannah soils and lack the cemented layer in the subsoil. They are less permeable than the Saffell and do not contain gravel. They have a finer textured subsoil and are less red than the Orangeburg soils.

The Ruston soils are extensive on the higher ridges that run north and south in the northern two-thirds of the county. Slopes range from nearly level to moderately steep. A large acreage of these soils, mostly on the more gentle slopes, is cultivated. Where the native woodland remains, the most common trees are loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum.

Ruston fine sandy loam, gently sloping phase (RuC) (3 to 8 percent slopes) (Capability unit IIIe–1).—This is a deep, well-drained, permeable soil that is well suited to early crops.

Profile in moist woodland (SW¼NW¼ sec. 14, T. 14 S., R. 10 W.):

A_1 0 to 2 inches, grayish-brown (10YR 5/2) fine sandy loam; weak, granular structure; friable; contains many roots; medium acid; clear, smooth boundary.

A_{21} 2 to 5 inches, brown (10YR 5/3) fine sandy loam; weak, granular structure; friable; contains many roots and fine pores; medium acid; clear, smooth boundary.

A_{22} 5 to 10 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, subangular blocky structure; friable; contains many roots and fine pores; medium acid; gradual, smooth boundary.

B_1 10 to 16 inches, reddish-yellow (7.5YR 6/8) sandy clay loam; moderate, medium, subangular blocky structure; friable when moist, slightly plastic when wet; contains many roots and fine pores; medium acid; gradual, smooth boundary.

B_{21} 16 to 30 inches, yellowish-red (5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; firm when moist, slightly plastic when wet; contains a few roots and many fine pores; medium acid; gradual, smooth boundary.

B_{22} 30 to 39 inches, yellowish-red (5YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; firm when moist, slightly plastic when wet; contains a few roots and pores; medium acid; gradual, smooth boundary.

C 39 to 64 inches +, strong-brown (7.5YR 5/8) sandy loam; single grained; very friable to loose; medium acid.

The surface soil is lighter brown in cultivated fields than in the wooded areas. It ranges from 8 to 18 inches in thickness. Small areas of very fine sandy loam and loamy sand are included. The color of the B horizon generally ranges from yellowish red to reddish brown, but in some places it is red.

This soil contains a medium amount of organic matter. The reaction is medium acid. Runoff is medium. The

permeability of the subsoil is moderate, and the available moisture holding capacity is moderate. Productivity is medium. The tilth of the plow layer is good.

Use and suitability.—This is the most extensive of the Ruston soils. Most of it has always been in woodland. It is productive of loblolly pine and shortleaf pine. It is well suited to all row crops grown in the county, especially the early crops. It needs proper fertilization and good protection against erosion. It is well suited to pasture.

Ruston fine sandy loam, nearly level phase (RuB) (1 to 3 percent slopes) (Capability unit IIe-3).—This soil is less likely to erode than Ruston fine sandy loam, gently sloping phase.

Use and suitability.—Most of this soil is cultivated. Small acreages are in woodland and pasture. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected from erosion, it is well suited to all row crops and most pasture plants grown in the county.

Ruston fine sandy loam, eroded gently sloping phase (RuC2) (3 to 8 percent slopes) (Capability unit IIIe-1).—This soil has more rapid runoff and a thinner surface layer than Ruston fine sandy loam, gently sloping phase.

Use and suitability.—A large acreage of this soil is cultivated, and a small amount is in pasture. Another small acreage that was formerly cultivated has reverted to woodland by natural reseeding or has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. It is well suited to all row crops and most pasture plants grown in the county, if it is properly fertilized and protected against erosion.

Ruston sandy clay loam, severely eroded gently sloping phase (RyC3) (3 to 8 percent slopes) (Capability unit IVe-1).—The plow layer of this soil consists of a mixture of the original fine sandy loam surface soil and reddish-yellow sandy clay loam subsoil. As a result, this soil now has a firm reddish-yellow sandy clay loam surface soil. It has more rapid runoff, slower infiltration, and poorer tilth than Ruston fine sandy loam, gently sloping phase.

Use and suitability.—Most of this soil was formerly cultivated, but, because of damage from erosion, it has been allowed to revert to pines and hardwood trees by natural reseeding or has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against further erosion, it is fairly well suited to small grains and pasture plants.

Ruston fine sandy loam, sloping phase (RuD) (8 to 12 percent slopes) (Capability unit IVe-1).—Runoff is more rapid on this soil than on Ruston fine sandy loam, gently sloping phase, and the hazard of erosion is more serious.

Use and suitability.—Most of this soil is in woodland. It is productive of loblolly pine, shortleaf pine, and hardwood trees. If it is properly fertilized and protected against erosion, it is fairly well suited to small grains and pasture plants.

Saffell Series

The Saffell series consists of well-drained, medium acid to strongly acid soils of the uplands. They were derived from gravelly Coastal Plain materials. The gravel is chert and quartz, and the pieces range up to 2 inches in diameter. The surface soil is dark-gray to pale-brown gravelly fine sandy loam. The subsoil is yellowish-red to red gravelly sandy clay loam.

These soils are moderately to rapidly permeable. They warm up early in spring. They are highly susceptible to erosion.

The Saffell soils are associated with the Ruston and Orangeburg soils. They differ from them in that they contain gravel and have a higher rate of infiltration. The B horizon of the Saffell soils is less red than that of the Orangeburg soils.

These soils are extensive on nearly level to moderately steep slopes on ridgetops, mostly in the northern half of the county. Native woodland of pines and hardwood trees covers about one-fourth of the sloping and moderately steep acreage. Loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum are common. Most of the nearly level and gently sloping areas are or have been cultivated. Large gravel pits are located on these soils (fig. 11).

Saffell gravelly fine sandy loam, gently sloping phase (SaC) (3 to 8 percent slopes) (Capability unit IIIe-1).—This is a deep, well-drained, gravelly soil on the uplands.

Profile in moist woodland (NE¼NW¼ sec. 26, T. 12 S., R. 12 W.):

A_0 ½ to 0 inch, dark-gray, partly decomposed leaf mold.

A_1 0 to 12 inches, pale-brown (10YR 6/3) gravelly fine sandy loam; structureless; friable; contains many pieces of chert and quartz gravel up to ½ inch in diameter; contains many roots; medium acid; abrupt, smooth boundary.

B_{21} 12 to 28 inches, yellowish-red (5YR 4/6) gravelly sandy clay loam; structureless; slightly plastic; contains so many pieces of gravel less than 1 inch in diameter that the gravel makes up the greater part of the soil by volume; contains many roots; strongly acid; diffuse boundary.

B_{22} 28 to 45 inches, yellowish-red (5YR 4/8) gravelly sandy clay loam; structureless; plastic; contains a considerable amount of gravel less than 1½ inches in diameter; the amount of gravel increases with depth; strongly acid; diffuse boundary.

C 45 to 58 inches, strong-brown (7.5YR 5/8) sand and gravel up to 2 inches in diameter; the gravel makes up the larger part of the soil by volume; structureless; strongly acid.

The surface soil is 8 to 15 inches thick. It is lighter colored in cultivated fields than in woodland. The amount of gravel in the surface soil ranges up to as much as 75 percent of the soil volume, but otherwise the texture of the surface soil is fairly uniform.

The texture of the B horizon ranges from sandy clay loam to sandy clay, and its color from yellowish red to reddish brown. The proportion of sand, clay, and gravel in the C horizon varies.

In small areas the subsoil is red. In other places where the soil is only moderately well drained, the lower part of the B horizon is mottled. Small areas of Cahaba gravelly fine sandy loam are included in this unit.

This soil contains a moderate amount of organic matter. The reaction is medium acid. Runoff is medium. The permeability of the subsoil is moderate to rapid. The available moisture holding capacity is low. Natural productivity is moderate. Tillage is difficult because of the gravel.

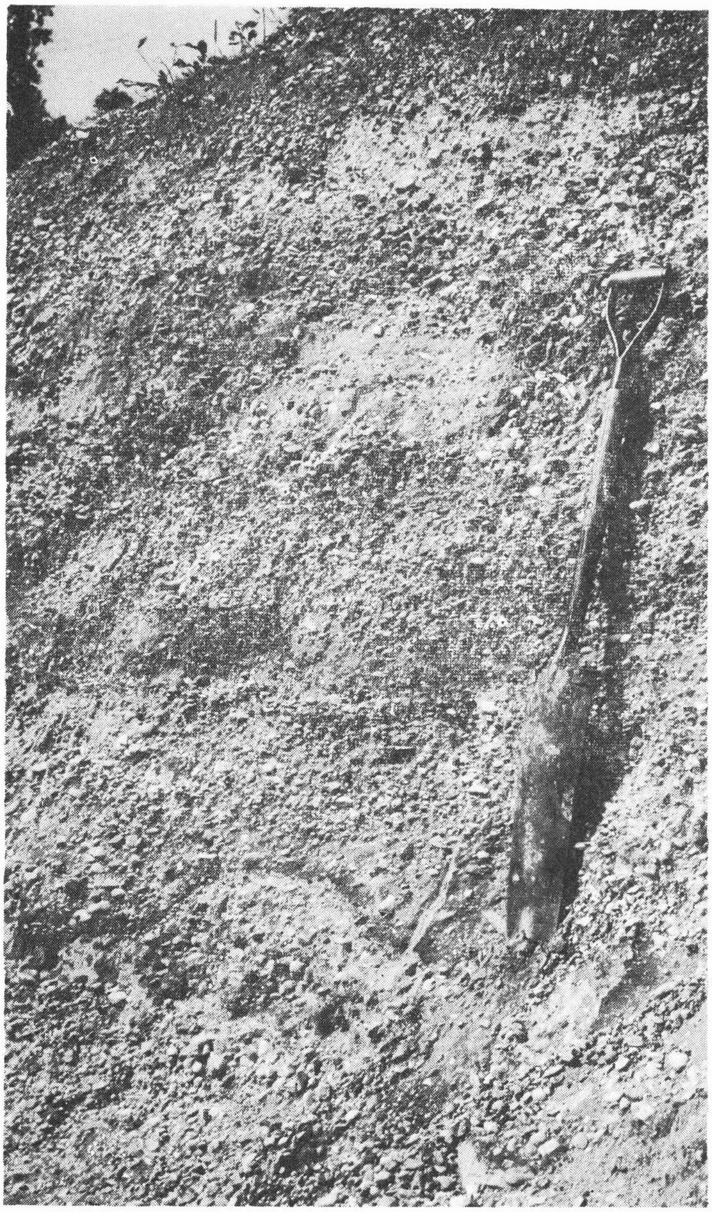

Figure 11.—**Gravel pit in Saffell soil, showing the chert and quartz gravel throughout the profile.**

Use and suitability.—Many acres of this soil are used as a source of gravel for building and highway construction. Most of the acreage that is not in gravel pits is in woodland (fig. 12). This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected against erosion, it is well suited to early crops and to most pasture plants grown in the county. Success with late crops is uncertain, due to droughtiness.

Saffell gravelly fine sandy loam, eroded gently sloping phase (SaC2) (3 to 8 percent slopes) (Capability unit IIIe-1).—The surface layer of this soil is thinner than that of Saffell gravelly fine sandy loam, gently sloping phase.

Use and suitability.—Most of this soil has been cultivated in the past. Some has now reverted to pines and hardwood trees by natural reseeding or has been replanted with pine seedlings. If this soil is properly fertilized and protected against erosion, it is well suited to early crops and to most pasture plants grown in the county.

Saffell gravelly fine sandy loam, severely eroded gently sloping phase (SaC3) (3 to 8 percent slopes) (Capability unit VIe-1).—This soil is like Saffell gravelly fine sandy loam, gently sloping phase, except that it has lost most of its surface layer by erosion. Runoff is more rapid, and the hazard of further erosion is greater.

Use and suitability.—In the past, most of this soil was cultivated or was used for pasture. It has now reverted to pines and hardwood trees by natural reseeding or has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is fairly well suited to small grains and pasture. Some small areas are used as a source of gravel.

Saffell gravelly fine sandy loam, sloping phase (SaD) (8 to 12 percent slopes) (Capability unit IVe-1).—Runoff is more rapid and the hazard of erosion is greater on this soil than on Saffell gravelly fine sandy loam, gently sloping phase.

Use and suitability.—Most of this soil is in native vegetation of pines and hardwood trees. It is productive of loblolly pine and shortleaf pine. It is fairly well suited to small grains and pasture if it is properly fertilized and protected against erosion.

Saffell gravelly fine sandy loam, eroded sloping phase (SaD2) (8 to 12 percent slopes) (Capability unit IVe-1).—The surface layer of this soil is thinner than that of Saffell gravelly fine sandy loam, gently sloping phase. Runoff is more rapid, and the danger of erosion is greater.

Use and suitability.—Most of this soil was formerly cultivated, but a large part has reverted to woodland by natural reseeding or has been replanted with pine seedlings. It is productive of loblolly pine and shortleaf pine. If it is properly fertilized and if good erosion control practices are used, this soil is fairly well suited to small grains and pasture. Some small areas are used as a source of gravel.

Saffell gravelly fine sandy loam, 12 to 25 percent slopes (SaE) (Capability unit VIIe-I).—The hazard of erosion is greater on this soil than on Saffell gravelly

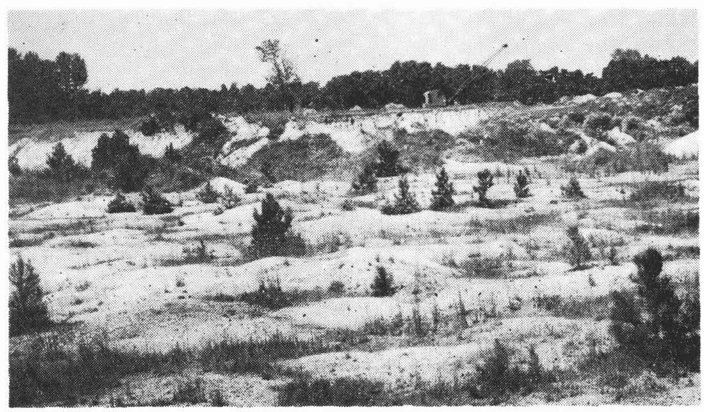

Figure 12.—**Natural reseeding of loblolly pine in abandoned gravel pit in Saffell soil.**

fine sandy loam, gently sloping phase. Runoff is more rapid.

Use and suitability.—The native vegetation of pines and hardwood trees covers all but a few acres of this soil. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected from erosion, it is fairly well suited to pasture. Some small areas are used as a source of gravel.

Savannah Series

The Savannah series consists of moderately well drained, medium acid to strongly acid soils that were derived from unconsolidated beds of sand, silt, and sandy clay.

The surface soil is grayish-brown to yellowish-brown silt to fine sandy loam. The subsoil is yellowish-brown sandy clay loam to sandy clay. The subsoil contains a pan that begins at a depth of 18 to 36 inches.

The productivity of these soils is moderate. Surface drainage is good, and internal drainage is moderate. Tilth is moderately good.

The Savannah soils are associated with the Ruston, Orangeburg, and Caddo soils. The Savannah soils are less well drained than the Ruston and Orangeburg soils, and their subsoil is yellowish brown instead of yellowish red. The Ruston and Orangeburg soils do not have a pan in the subsoil. The Caddo soils are less well drained and have a mottled subsoil.

These soils are extensive in the northern two-thirds of the county. They occupy nearly level to sloping areas in the uplands, between the high ridges and the flats. A large acreage is cultivated or in pasture. The rest is in native hardwood trees and pines. Some common tree species are loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum.

Savannah very fine sandy loam, gently sloping phase (SdC) (3 to 8 percent slopes) (Capability unit IIIe–2).—This is a deep, moderately well drained, productive soil of the uplands.

Profile in moist woodland (NE¼SE¼ sec. 8, T. 12 S., R. 10 W.):

A_1 0 to 5 inches, grayish-brown (10YR 5/2) very fine sandy loam; weak, fine, granular structure; friable; contains many roots and fine, soft, black concretions; medium acid; clear, smooth boundary.

A_2 5 to 13 inches, yellowish-brown (10YR 5/4) very fine sandy loam; weak, medium, blocky structure; friable; contains many fine pores, many fine roots, and fine, soft, black concretions; strongly acid; gradual, smooth boundary.

B_1 13 to 20 inches, yellowish-brown (10YR 5/8) fine sandy loam or light sandy clay loam; weak, medium, subangular blocky structure; fine and medium, soft and hard, black concretions are common; roots and pores are common; strongly acid; gradual, smooth boundary.

B_2 20 to 36 inches, yellowish-brown (10YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; slightly plastic; roots and pores are common; strongly acid; gradual, wavy boundary.

B_{3m} 36 to 45 inches, yellowish-brown (10YR 5/8) sandy clay loam that has many medium, light brownish-gray (10YR 6/2) and light-gray (10YR 7/2) mottles; breaks into moderate, blocky peds; slightly plastic when moist, very hard when dry; contains many pores and a few roots; fine and medium, hard and soft, black concretions are common; strongly acid; gradual, wavy boundary.

C 45 to 72 inches, yellowish-brown (10YR 5/8) sandy clay loam that has many medium and coarse mottles of brown, gray, and brownish gray; moderate, medium, blocky structure; slightly plastic when moist, hard when dry; fine pores and black concretions are common; strongly acid.

The surface soil is 6 to 14 inches thick. Its texture ranges from silt loam to fine sandy loam, but very fine sandy loam predominates. The mottled horizon begins 18 to 36 inches below the surface, and it is 10 to 15 inches thick. This mottled horizon has characteristics of a pan; these characteristics vary from one place to another in degree of development. In many places the underlying material is sandy clay loam that contains varying amounts of gravel interbedded with clay layers.

Areas of Bowie, Ora, and Norfolk fine sandy loams and Savannah gravelly fine sandy loam, too small to map separately, were included in this mapping unit.

The natural fertility of this soil is medium to high. The content of organic matter is medium to large. The reaction is medium acid. Runoff is medium, and the permeability of the subsoil is moderate. The available moisture holding capacity is moderate. Tilth is good.

Use and suitability.—Most of the acreage has always been in woodland of pines and hardwood trees. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected against erosion, it is well suited to row crops and pasture plants.

Savannah very fine sandy loam, level phase (SdA) (0 to 1 percent slopes) (Capability unit I–2).—Runoff is slower on this soil than on Savannah very fine sandy loam, gently sloping phase. There is very little hazard of erosion.

Use and suitability.—A large acreage is in the native hardwood trees and pines. Small areas are cultivated or in pasture. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and otherwise well managed, it is well suited to row crops and pasture plants.

Savannah very fine sandy loam, nearly level phase (SdB) (1 to 3 percent slopes) (Capability unit IIe–1).—This soil has slower runoff and less hazard of erosion than Savannah very fine sandy loam, gently sloping phase.

Use and suitability.—This is the most extensive of the Savannah soils in this county. A large acreage is in native vegetation of pines and hardwood trees. Small areas are cultivated or in pasture. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected against erosion, it is well suited to row crops and pasture plants.

Savannah very fine sandy loam, eroded nearly level phase (SdB2) (1 to 3 percent slopes) (Capability unit IIe–1).—Runoff is slower and the hazard of erosion is less serious on this soil than on Savannah very fine sandy loam, gently sloping phase.

Use and suitability.—Most of the acreage was formerly cultivated. Some areas have reverted to woodland by natural reseeding or have been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is well suited to row crops and pasture plants.

Savannah very fine sandy loam, eroded gently sloping phase (SdC2) (3 to 8 percent slopes) (Capability unit

IIIe–2).—The surface layer of this soil is thinner than that of Savannah very fine sandy loam, gently sloping phase. Runoff is somewhat more rapid.

Use and suitability.—A large acreage of this soil has been cultivated in the past. Some has reverted to woodland by natural reseeding, and some has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. It is well suited to row crops and pasture plants if it is properly fertilized and protected against erosion.

Savannah very fine sandy loam, sloping phase (SdD) (8 to 12 percent slopes) (Capability unit IVe–2).—This soil has more rapid runoff and a greater hazard of erosion than Savannah very fine sandy loam, gently sloping phase.

Use and suitability.—Most of the acreage is in the native vegetation of pines and hardwood trees. Small areas are cultivated or used for pasture. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected against erosion, it is fairly well suited to small grains, legumes, and pasture plants.

Sawyer Series

The Sawyer series consists of somewhat poorly drained, medium acid to strongly acid soils. They were derived from unconsolidated beds of sand, silt, and clay or from soft clay shale.

The surface soil is dark grayish-brown to yellowish-brown silt loam to fine sandy loam. The subsoil is yellow to yellowish-red sandy clay loam to clay. It is underlain, at depths of about 18 to 30 inches, by plastic clay of various colors.

Internal drainage is slow, and permeability is slow. The erosion hazard is high, especially in the more strongly sloping areas.

The Sawyer soils are associated with the Wilcox, Boswell, and Shubuta soils. The subsoil of the Sawyer soils is coarser textured than that of the Boswell or Wilcox soils and yellower than that of any of the associated soils. The Sawyer soils have better drainage than the Wilcox soils.

These soils are extensive in the northern half of the county. They lie on level to moderately steep uplands. A large acreage is in native woodland of pines and hardwood trees. Loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum are common species.

Sawyer very fine sandy loam, eroded nearly level phase (SfB2) (1 to 3 percent slopes) (Capability unit IIIe–3).—This is a somewhat poorly drained soil of low productivity. It is located on the uplands.

Profile in a moist, idle field (SE¼NE¼ sec. 7, T. 12 S., R. 9 W.):

A_{1p} 0 to 4 inches, dark grayish-brown (10YR 4/2) very fine sandy loam; single grained; very friable; contains many roots and a few fine pores; medium acid; clear boundary.

A_{2p} 4 to 8 inches, yellowish-brown (10YR 5/4) very fine sandy loam; weak, medium, angular blocky structure; friable; contains many roots, many small pores, and a few small, soft, dark concretions; strongly acid; clear smooth boundary.

B_1 8 to 18 inches, yellowish-red (5YR 5/6) sandy clay loam that has a few faint, gray mottles; weak, medium, angular blocky structure; slightly plastic; contains many fine roots, many fine pores, and small, soft, dark concretions; very strongly acid; diffuse boundary.

B_2 18 to 27 inches, variegated red (10YR 4/6), brown (7.5YR 5/4), and gray (N 5/0) sandy clay; moderate, medium, angular blocky structure; plastic; contains a few small roots; pores and soft, dark concretions are common; very strongly acid; gradual boundary.

C 27 to 48 inches +, gray (7.5YR 5/0) clay that has many small, distinct mottles of yellowish red (5YR 5/8) and various shades of brown; moderate, medium, angular blocky structure; very plastic; small roots, pores, and dark concretions are common; very strongly acid.

The surface soil is 6 to 10 inches thick. It ranges in color from dark grayish brown to yellowish brown, and in texture from silt loam to fine sandy loam. The B horizon ranges from yellow to yellowish red in color, and the lower part is mottled with various shades of red, brown, and gray. Its texture is sandy clay loam to sandy clay. The C horizon is mottled with various shades of red, brown, and gray. Its texture ranges from sandy clay loam to clay.

The natural fertility of this soil is moderate to low. The supply of organic matter is small to moderate. Runoff is medium, the permeability of the subsoil is slow, and the available moisture holding capacity is moderate. Tilth is good.

Use and suitability.—Most of this soil has been cultivated in the past, but some has reverted to pines and hardwood trees by natural reseeding and some has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is fairly well suited to small grains, pasture plants, cotton, and corn.

Sawyer very fine sandy loam, level phase (SfA) (0 to 1 percent slopes) (Capability unit IIe–2).—The surface layer of this soil is thicker than that described for Sawyer very fine sandy loam, eroded nearly level phase. Runoff is slower, and there is very little hazard of erosion.

Use and suitability.—A large acreage of this soil is in woodland of pines and hardwood trees. Some areas are cultivated or used for pasture. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized, it is fairly well suited to row crops and pasture plants.

Sawyer very fine sandy loam, nearly level phase (SfB) (1 to 3 percent slopes) (Capability unit IIe–2).—The surface layer of this soil is thicker than that of Sawyer very fine sandy loam, eroded nearly level phase. Runoff is somewhat slower on this soil.

Use and suitability.—Most of this soil is in the native woodland of pines and hardwood trees. Small areas are cultivated or in pasture. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected from erosion, it is fairly well suited to row crops and pasture plants.

Sawyer very fine sandy loam, gently sloping phase (SfC) (3 to 8 percent slopes) (Capability unit IIIe–3).—Although this soil has more rapid runoff and a greater hazard of erosion than Sawyer very fine sandy loam, eroded nearly level phase, it has a thicker surface layer.

Use and suitability.—Most of this soil has always been in the native pines and hardwood trees. Small areas are cultivated or used for pasture. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected against erosion, it is fairly well suited to row crops and pasture plants.

Sawyer very fine sandy loam, eroded gently sloping phase (SfC2) (3 to 8 percent slopes) (Capability unit IIIe-3).—This soil has more rapid runoff and a greater hazard of erosion than Sawyer very fine sandy loam, eroded nearly level phase.

Use and suitability.—Most of this soil was cultivated in the past, but a large acreage has now reverted to pines and hardwood trees by natural reseeding or has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is fairly well suited to row crops and pasture plants.

Sawyer very fine sandy loam, moderately steep phase (SfE) (12 to 20 percent slopes) (Capability unit VIe-2).—Runoff is more rapid and the hazard of erosion is considerably greater on this soil than on Sawyer very fine sandy loam, eroded nearly level phase.

Use and suitability.—Most of this soil has been cultivated but has now reverted to pines and hardwood trees by natural reseeding or has been replanted with pine seedlings. It is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is fairly well suited to pasture. It is best suited to woodland.

Shubuta Series

The Shubuta series consists of moderately well drained, medium acid to strongly acid soils that were derived from unconsolidated beds of sand, silt, and clay, or from soft clay shale. The surface soil is dark grayish-brown to yellowish-brown fine sandy loam. The subsoil is yellowish red to red, and its texture ranges from sandy clay loam to sandy clay. At a depth of about 16 to 30 inches, the material is sandy clay to clay of varying colors.

These soils have moderately slow permeability. They are subject to a moderate amount of erosion.

The Shubuta soils are associated with the Wilcox, Boswell, and Sawyer soils. They have a coarser textured subsoil than any of the three associated series. They are better drained and more friable than the Wilcox or Boswell soils, and they have a redder subsoil than the Sawyer soils.

The Shubuta soils developed on nearly level to moderately steep uplands in the northern half of the county. The natural woodland of pines and hardwood trees covers about half of the acreage. Shortleaf pine, loblolly pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum are common. A considerable acreage is used for row crops.

Shubuta fine sandy loam, eroded nearly level phase (ShB2) (1 to 3 percent slopes) (Capability unit IIe-2).—This is a moderately well drained, highly erodible soil on the uplands.

Profile in a cultivated area (SE¼SW¼ sec. 27, T. 13 S., R. 10 W.):

A_p 0 to 8 inches, yellowish-brown (10YR 5/4) fine sandy loam; single grained; very friable; contains a few fine pores and a few fine roots; contains a few small, dark, hard concretions; medium acid; clear boundary.

B_{21} 8 to 16 inches, yellowish-red (5YR 5/8) sandy clay; fine to medium, angular blocky structure; firm but friable when moist, slightly plastic when wet; contains a few fine pores, a few fine roots, and a few small, hard, dark concretions; strongly acid; gradual boundary.

B_{22} 16 to 30 inches, variegated red (2.5YR 4/6), light yellowish-brown (10YR 6/4), and brown (7.5YR 5/4) sandy clay; moderate, medium, angular blocky structure; firm but friable when moist, plastic when wet; contains a few fine pores, a few fine roots, and small, hard, dark concretions; strongly acid; gradual boundary.

C 30 to 48 inches, sandy clay to clay, mottled with red (2.5YR 5/6), light yellowish brown (10YR 6/4), and gray (10YR 6/1); the red mottles are fine and prominent in the upper part, and the amount of gray increases with depth; weak, coarse, subangular blocky structure; plastic, but crumbles easily; contains a few fine pores and small, hard, dark concretions; strongly acid.

In most places the A horizon is fine sandy loam, but in some small areas it is very fine sandy loam. It is 6 to 10 inches thick and ranges in color from dark grayish brown to yellowish brown. The B horizon ranges in texture from sandy clay to sandy clay loam and in color from red to yellowish red. The mottles in the C horizon are of various shades of red, brown, and gray. The texture of the C horizon is fine sandy loam to clay.

Some areas of Shubuta pebbly very fine sandy loam and Cuthbert pebbly very fine sandy loam are included in this unit, because they are too small to map separately. None of the Cuthbert soils have been mapped separately in Bradley County.

The natural fertility of this soil is moderate. The supply of organic matter is moderate. The reaction is medium acid. Runoff is medium, the permeability of the subsoil is moderate, and the available moisture holding capacity is moderate. Tilth is good.

Use and suitability.—A large acreage of this soil has always been in woodland. Some areas that were formerly cultivated have reverted to hardwood trees and pines by natural reseeding or have been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected against erosion, it is fairly well suited to most row crops and pasture plants grown in the county.

Shubuta fine sandy loam, eroded gently sloping phase (ShC2) (3 to 8 percent slopes) (Capability unit IIIe-3).—This soil has more rapid runoff and a greater hazard of erosion than Shubuta fine sandy loam, eroded nearly level phase.

Use and suitability.—Most of this soil has been cultivated in the past. A large acreage has reverted to woodland by natural reseeding or has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is fairly well suited to most row crops and pasture plants grown in the county.

Shubuta gravelly fine sandy loam, moderately steep phase (ShE) (12 to 20 percent slopes) (Capability unit VIe-2).—This soil lies in long, narrow strips bordering streams north and northeast of Warren. It has more rapid runoff and a greater erosion hazard than Shubuta fine sandy loam, eroded nearly level phase. This soil contains many pieces of ironstone and sandstone gravel less than 1 inch in diameter. Areas too small to separate, with slopes of 8 to 12 percent, were included in this unit.

Use and suitability.—Most of this soil is in the native vegetation of pines and hardwood trees. It is productive of loblolly pine and shortleaf pine. It is fairly well suited to pasture if it is properly fertilized and protected against erosion. Its best use is woodland.

Stough Series

The Stough series consists of somewhat poorly drained, medium acid to strongly acid soils on stream terraces. They were derived from sediments that washed from the Ruston, Savannah, and Pheba soils of the uplands.

The surface soil is light yellowish-gray to yellowish-brown silt loam to fine sandy loam. The subsoil ranges from silt to sandy clay loam; it is mottled in yellow, brown, and gray colors. A panlike formation 2 to 20 inches thick lies in the subsoil at depths of 12 to 40 inches. In some areas, mounds 2 to 4 feet in height and 50 to 100 feet in diameter occupy more than 20 percent of the surface. The elevation of the pan layer is constant.

Internal drainage is slow, and permeability is slow. Productivity is low.

These soils are associated with the Kalmia, Prentiss, and Myatt soils. The Kalmia and Prentiss soils are better drained than the Stough soils and have no mottles in the subsoil. The Stough soils are better drained, slightly higher in elevation, and more yellow in the subsoil than the Myatt soils.

They are level to gently sloping. The natural vegetation of pines and hardwood trees covers most of the acreage. Some common trees are loblolly pine, shortleaf pine, red oak, white oak, post oak, pin oak, hickory, sweetgum, and blackgum.

Stough very fine sandy loam, nearly level phase (StB) (1 to 3 percent slopes) (Capability unit IIw–1).—This mottled gray and brown soil on stream terraces is limited in use by poor drainage and a high water table.

Profile in moist woodland (NW¼SE¼ sec. 1, T. 16 S., R. 10 W.):

A 0 to 7 inches, gray (10YR 5/1) very fine sandy loam that has stains or small faint mottles of yellowish brown (10YR 5/4); weak, medium, angular blocky structure; friable; contains many small pores and many small roots; strongly acid; gradual boundary.

B_1 7 to 22 inches, light yellowish-brown (10YR 6/4) very fine sandy loam that has many fine mottles of gray (10YR 5/1) and yellowish brown (10YR 5/8); weak, medium, subangular blocky structure; friable; contains many small pores and many small roots; very strongly acid; irregular boundary.

B_{2m} 22 to 28 inches, mottled light yellowish-brown (10YR 6/4), gray (10YR 5/1), and yellowish-brown (10YR 5/8) sandy clay loam; strong, medium, angular blocky structure; compact but breaks into a friable mass; contains many fine pores, many small roots, and a few small, soft, dark concretions; very strongly acid; irregular boundary.

B_3 28 to 42 inches, yellowish-brown (10YR 5/4) sandy clay to sandy clay loam; a few large, gray (10YR 5/1) mottles; moderate to strong, coarse, angular blocky structure; friable; contains small pockets or lenses of clay and sand; contains many small pores, a few small roots, and soft, dark concretions; very strongly acid; irregular boundary.

C 42 to 64 inches, mottled yellowish-brown (10YR 5/4), gray (10YR 5/1), and brownish-yellow (10YR 6/8) sandy clay that contains bits of dark grayish-brown (10YR 4/2) clay; moderate, medium, subangular blocky structure, but some platy structure is evident; firm; pores and small roots are common; very strongly acid.

The surface soil is 6 to 10 inches thick. It ranges in color from gray to light grayish brown and in texture from silt loam to fine sandy loam. The subsoil varies in number, size, and intensity of mottles. Its texture ranges from silt to sandy clay loam. The panlike formation varies from 2 to 20 inches in thickness. It lies at a depth of 12 to 40 inches below the surface.

This soil contains a medium to small amount of organic matter. The fertility is medium to low. The reaction is strongly acid. Runoff is medium, the subsoil is moderately slowly permeable, and the available moisture holding capacity is moderate. Tilth is fair.

Use and suitability.—Most of the acreage is in woodland of pines and hardwood trees. Small areas are cultivated or used for pasture. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and if good surface drainage is established, this soil is fairly well suited to row crops and pasture.

Stough very fine sandy loam, level phase (StA) (0 to 1 percent slopes) (Capability unit IIw–1).—Runoff is slower on this soil than on Stough very fine sandy loam, nearly level phase. There is very little erosion.

Use and suitability.—Most of this soil is in native pines and hardwood trees, but small areas are cultivated or in pasture. This soil is productive of loblolly pine and shortleaf pine. If drained and properly fertilized, it is fairly well suited to row crops and pasture.

Stough-Kalmia complex, mound phase (SK) (0 to 1 percent slopes) (Capability unit IIIw–2).—The Stough soil in this complex differs from Stough very fine sandy loam, nearly level phase, in having mounds scattered over more than 20 percent of its surface. These mounds have no set pattern in height or diameter.

The soil on the mounds has a profile similar to that of the Kalmia soils, except that it has the panlike layer that is characteristic of the surrounding Stough soil. The panlike layer occurs at approximately the same elevation under the mounds as under the areas between the mounds.

Use and suitability.—Most of this complex is in the native pines and hardwood trees. Small areas are used for row crops or pasture. These soils are productive of loblolly pine and shortleaf pine. If properly fertilized and drained, they are fairly well suited to row crops and pasture.

Tickfaw Series

The Tickfaw series consists of poorly drained, medium acid to strongly acid soils on uplands. They were derived from a thin mantle of loess over unconsolidated beds of sand, silt, and silty clay. The surface soil is dark grayish-brown to gray silt to fine sandy loam mottled with brown. The subsoil of silty clay to silty clay loam is gray mottled with brown. Small areas of the Tickfaw soils are widely distributed in the northern two-thirds of Bradley County. They are closely associated with the Caddo soils. The only mapping unit in which they occur is Caddo and Tickfaw silt loams. It is described under the Caddo series. A profile of Tickfaw silt loam is included in that description.

The undifferentiated mapping unit that contains both Tickfaw soils and Caddo soils is associated with the Savannah, Pheba, and Lewiston soils in level areas. The Tickfaw soils are less well drained than the associated soils, they are grayer in color and finer in texture, and they lack a compact horizon.

Most of the Tickfaw soils are covered by the native vegetation of pines and hardwood trees. Loblolly pine,

shortleaf pine, post oak, red oak, water oak, blackgum, and sweetgum are common woodland species.

These soils are droughty in summer. Permeability is slow.

Wilcox Series

The Wilcox series consists of somewhat poorly drained, strongly to very strongly acid soils derived from unconsolidated beds of sand, silt, and clay, or from soft clay shale.

The surface soil is dark gray to grayish brown. It ranges in texture from very fine sandy loam to silty clay loam. The subsoil is plastic clay that is mottled in red and gray.

These soils are slowly permeable. The internal drainage is slow. The hazard of erosion is high.

The Wilcox soils have poorer drainage and finer textured subsoils than the Boswell, Shubuta, and Sawyer soils, which are associated with them. The subsoil of the Wilcox soils differs in color from the yellow subsoil of the Sawyer and the red subsoils of the Boswell and Shubuta soils.

The Wilcox soils occur in the northern half of the county, and in a long narrow strip along the Saline River, south of Warren. Native woodland covers most of the acreage. Some common species are loblolly pine, shortleaf pine, red oak, white oak, post oak, hickory, sweetgum, and blackgum.

Wilcox silty clay loam, gently sloping phase (WcC) (3 to 8 percent slopes) (Capability unit IVe–3).—This is a somewhat poorly drained, highly erodible soil of the uplands. Its clayey surface soil and plastic clay subsoil greatly limit its use.

Profile in moist woodland (SW¼SE¼ sec. 27, T. 12 S., R. 10 W.):

A_0 ½ to 0 inch, very dark gray, partly decomposed leaf litter.

A_1 0 to 4 inches, dark-gray (5YR 4/1) silty clay loam; moderate, medium, subangular blocky structure; plastic; contains many roots; strongly acid; clear boundary.

B 4 to 28 inches, mottled gray (5YR 6/1) and red (2.5YR 4/6) clay; mottles are fine and prominent; massive; very plastic; contains a few roots; very strongly acid; diffuse boundary.

C 28 to 50 inches, gray (5YR 6/1) clay that has a few fine, faint, red (2.5YR 4/6) mottles; moderate, medium, angular blocky structure; very plastic; contains a few small roots and a few small dark concretions; very strongly acid.

Where it is cultivated, the surface soil is light gray and from 4 to 8 inches thick. In some small areas, the texture is silt loam or very fine sandy loam. The size and number of the red and gray mottles in the subsoil varies considerably.

This soil contains little organic matter. The fertility is low. The reaction is strongly acid. Runoff is medium to rapid, and the permeability of the subsoil is very slow. The available moisture holding capacity is moderate. Tilth is poor.

Use and suitability.—Most of this soil has always been in woodland. The soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is fairly well suited to small grains and pasture. It is best suited to woodland and pasture.

Wilcox silty clay loam, level phase (WcA) (0 to 1 percent slopes) (Capability unit IIIw–1).—Runoff is slower and the erosion hazard is less serious on this soil than on Wilcox silty clay loam, gently sloping phase.

Use and suitability.—A large acreage of this soil is in pines and hardwood trees. Part of it has been cultivated but has since reverted to woodland by natural reseeding or has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized, it is fairly well suited to cotton and small grains. It is best suited to woodland and pasture.

Wilcox silty clay loam, nearly level phase (WcB) (1 to 3 percent slopes) (Capability unit IIIe–3).—This soil has slower runoff and a less serious hazard of erosion than Wilcox silty clay loam, gently sloping phase.

Use and suitability.—Most of the acreage is in pines and hardwood trees. Small areas are cultivated or used for pasture. This soil is productive of loblolly pine and shortleaf pine. If it is properly fertilized and protected against erosion, it is fairly well suited to cotton and small grains. It is best suited to woodland and pasture.

Wilcox silty clay loam, eroded gently sloping phase (WcC2) (3 to 8 percent slopes) (Capability unit IVe–3).—This soil has a thinner surface soil and more rapid runoff than Wilcox silty clay loam, gently sloping phase.

Use and suitability.—Most of the acreage has been cultivated but has since reverted to woodland by natural reseeding or has been replanted with pine seedlings. This soil is productive of loblolly pine and shortleaf pine. If properly fertilized and protected against erosion, it is fairly well suited to small grains. It is best suited to woodland and pasture.

Wilcox silty clay loam, moderately steep phase (WcE) (12 to 20 percent slopes) (Capability unit VIIe–2).—Runoff is more rapid and the erosion hazard is greater on this soil than on Wilcox silty clay loam, gently sloping phase.

Use and suitability.—This soil has always been in woodland. It is productive of loblolly pine and shortleaf pine. If properly fertilized and protected from erosion, it is fairly well suited to pasture. It is best suited to woodland.

Wilcox silty clay loam, steep phase (WcF) (Slopes of 20 percent or more) (Capability unit VIIe–2).—This soil has more rapid runoff and a greater hazard of erosion than Wilcox silty clay loam, gently sloping phase.

Use and suitability.—This soil has always been in woodland. It is productive of loblolly pine and shortleaf pine. It has very little value for pasture, and its best use is woodland.

Formation, General Characteristics, and Classification of Soils

Formation of Soils of the County

The characteristics of a soil depend on the interaction of the five factors of soil formation—climate, living organisms, parent material, topography, and time. The relative importance of each factor varies from one place to another. In some places one dominant factor determines most of the soil properties.

In Bradley County, for example, the Boswell and Ruston soils developed on the same kind of topography under the same kind of vegetation, but they differ in several properties because the Boswell soils developed from clayey parent material and the Ruston soils developed from sandy parent material. The Caddo and Myatt soils have similar profiles because of similarities in their parent materials and in their relief.

Climate.—In Bradley County, the warm, humid, continental climate has been a uniform factor in soil development. The average temperatures and distribution of rainfall are shown in table 11 on page 61.

The soils are warm enough for activity of micro-organisms from about March 30 to November 4. Between about June 1 and September 30, the average temperature is about 80° F.

The soils are moist and subject to leaching much of the time from November 15 to June 15. They are dry to moderately dry much of the time from July 1 to October 31.

Freezing and thawing have little effect on weathering and formation of soils in this county, because the soils are frozen for only short periods and to depths of only a few inches.

The warm, humid climate has caused most of the soils on the terraces and uplands to be strongly weathered, leached, and acid, and to be moderate in fertility. The Lafe soils have not been so strongly weathered, and they are strongly alkaline.

Living organisms.—Before the county was settled, the native vegetation had more influence on soil development than animal activity did. Pines and hardwood trees covered the uplands and terraces. The most common species were red oak, white oak, post oak, willow oak, water oak, hickory, sweetgum, blackgum, ash, loblolly pine, and shortleaf pine.

On the bottom lands the cover was hardwood trees. The most common species here were willow oak, water oak, hickory, elm, pecan, maple, cypress, beech, sweetbay, and hackberry. Differences in native vegetation seem to be associated mainly with differences in drainage or in frequency and duration of flooding.

Parent materials.—Most of the soils in Bradley County have developed in sediments deposited in the Gulf of Mexico when it extended northward to or almost to the foot of the Ouachita Mountains. These sediments consist mostly of noncalcareous sands, silts, clays, and in a few places, gravel. The sediments occur in strata ranging in thickness from less than a foot to more than 10 feet. The geologic formations that are presently at the surface date from Tertiary, Pleistocene, and Recent times (*14*).

On the flood plains of the Saline and Ouachita Rivers and their tributaries, the parent materials consist of recent alluvium washed from the terraces and uplands.

Topography.—Bradley County is on the Gulf Coastal Plain, which is a smooth plain that slopes gently southward (*4*). It is crossed by several moderately large streams, all flowing southward. Each stream flows in a shallow, flat-bottomed valley whose width depends mainly on the size of the stream. The chief tributaries flow generally southward.

Belts of upland, ranging from less than a mile to several miles in width and lying next to the valleys on both sides of the main streams, have been dissected into hills by erosion. These belts of hills or ridges are extensive near Hermitage and along the Saline River from Warren to Johnsville. They are well drained. In elevation the hills range from 20 to 50 feet above the first bottoms, but none rises above the original level of the plain. Farther back from the streams, the original plain is still intact.

Between each of the major systems of stream, valley, and hilly belts, the divides, especially in the southern half of the county, are level or nearly level. These areas are locally known as "flatwoods." They have poor natural drainage (*4*).

Time.—The length of time required for soil development depends to a large extent on the other factors of soil formation. A soil can develop to maturity in less time in a humid, warm region with luxuriant vegetation than it can in a dry or cold region with scanty vegetation. It takes less time to develop a soil from coarse-textured parent material than from fine-textured parent material. Generally, the older soils show a greater degree of differentiation between horizons.

The age of the soils in Bradley County varies considerably. The soils on the smoother parts of the uplands and on the older stream terraces have developed to maturity. On the stronger slopes, geologic erosion has more nearly kept pace with soil development, consequently the horizons are not so thick nor so strongly developed as in the mature soils. On the first bottoms and where local alluvium is deposited, the soil materials have been in place for too short a time to allow the soils to develop to maturity.

General Characteristics of Soils of the County

The soils of Bradley County generally have well-defined horizons that have developed by one or more of the following processes: (1) Accumulation of organic matter, (2) leaching of carbonates and salts more soluble than calcium carbonate, (3) translocation of silicate clay minerals, and (4) reduction and transfer of iron and manganese.

Organic matter has accumulated in the uppermost layer of all of the county's soils to form an A_1 horizon. Most of the soils sampled are low in organic matter. A few soils on the bottom lands, such as the Ochlockonee and Iuka soils, have a medium amount of organic matter.

The differentiation between the darker colored A_1 and the lighter A_2 horizons in most soils of the county is caused by the addition of organic matter to the A_1 and the removal of organic matter, clay minerals, and iron oxides from the A_2.

Leaching of carbonates and salts has occurred in all soils of the county and is important in development of horizons in most of them. The carbonates and salts are gone from most of the soils. Leaching has been less important in differentiating the horizons in the Myatt, Bibb, Ocklockonee, Mantachie, Iuka, and Chastain soils. The Lafe soils are the only ones in which the content of salt is still high.

Translocation of silicate clay minerals—that is, movement downward to a lower layer in the soil—has been one of the chief factors in the development of soil hori-

zons in the county. The Ruston, Boswell, Shubuta, and Sawyer soils clearly show the effects of this process.

Reduction and transfer of iron, also called gleying, has occurred in all of the very poorly drained, poorly drained, and somewhat poorly drained soils. It has been important in differentiating horizons in the naturally wet Myatt, Bibb, and Chastain soils. Some gleying has occurred in the Prentiss, Savannah, and other moderately well drained soils.

The gray colors of the deeper horizons of the wet soils indicate reduction of iron oxides. In some soils, reduction is accompanied by transfer of iron. In some places, the iron is segregated within one or more horizons to form mottles of various shades of red, brown, and yellow. In some places, the iron compounds have been segregated and formed into concretions. This is most common in the somewhat poorly drained and poorly drained soils.

The effects of soil-forming processes on development of two representative soils of the county are illustrated by the detailed profile descriptions that follow and by the laboratory data on samples of the same profiles (table 9). Two profiles of Myatt silt loam and two of Caddo silt loam are described and analyzed.

The Myatt and Caddo soils differ chiefly in topographic position and in age. The Myatt soils are the younger. They developed on stream terraces from material that was washed from the uplands on which the Caddo soils developed. Other soil-forming factors were similar for the two series, and the soils therefore have many similarities in their general characteristics. Both have weak A_1 horizons and small differences in texture of their various horizons. Both are predominantly gray mottled with yellowish brown. Both contain concretions. They are similar in reaction.

Profile of Myatt silt loam in woodland (NE¼NW¼ sec. 22, T. 16 S., R. 12 W.):

A_g 0 to 8 inches, gray (10YR 5/1) silt loam; few medium mottles of very dark gray (10YR 3/1); weak, medium, subangular blocky structure; friable; many roots; pH 5.0; diffuse boundary.

B_{11g} 8 to 20 inches, gray (10YR 6/1) silt loam; many medium and coarse mottles of yellowish brown (10YR 5/6); weak, medium, angular blocky structure; firm when moist, plastic when wet; contains many roots; pH 4.0; diffuse boundary.

B_{12g} 20 to 35 inches, gray (10YR 6/1) silt loam; many medium and coarse mottles of yellowish brown (10YR 5/6); weak, medium, angular blocky structure; friable when moist; slightly hard when dry; roots are common; pH 5.0; diffuse boundary.

B_{2g} 35 to 47 inches, gray (10YR 6/1) silty clay loam; few medium and coarse mottles of yellowish brown (10YR 5/6); massive; firm when moist, plastic when wet; a few fine hard concretions; a few roots; pH 4.4; gradual, wavy boundary.

C_g 47 to 58 inches +, gray (10YR 6/1) silty clay loam; many mottles of yellowish brown (10YR 5/6); massive; very firm when dry; a few fine, hard concretions; a few small pockets of clear crystals that appear to be gypsum; pH 4.9.

Profile of Myatt silt loam in woodland (NW¼NW¼ sec. 12, T. 16 S., R. 12 W.):

A_0 2 to 0 inch, leaf litter, not sampled.

A_{21g} 0 to 8 inches, gray (10YR 6/1) silt; few fine mottles of yellowish brown (10YR 5/4); massive, but crushes readily to fine, medium, angular blocky fragments; friable when moist; many fine and medium roots; a few fine pores; pH 4.8; gradual, smooth boundary.

A_{22g} 8 to 25 inches, gray (10YR 6/1) silt; few fine and medium mottles of yellowish brown (10YR 5/4); massive, but breaks readily to fine angular blocky fragments; slightly hard when dry, very friable when moist; fine and medium roots are common; the fragments contain numerous fine and medium pores; a few medium hard concretions that are black internally; sample contains a piece of charcoal 1 inch thick and a few inches in length; pH 5.1; clear wavy boundary.

B_{2g} 25 to 35 inches, pale-brown (10YR 6/3) silt loam that has common medium mottles of yellowish-brown (10YR 5/4); massive in place, but breaks readily into moderate, coarse, angular blocky fragments; firm when moist, plastic when wet; fine and medium roots are common; some coarse vertical cracks; numerous fine and medium pores; a few medium and coarse, hard concretions that are black internally; pH 4.4; gradual, smooth boundary.

B_{3g} 35 to 49 inches, grayish-brown (10YR 5.5/2) silt loam; common, medium mottles of yellowish brown (10YR 5/4); massive in place, but can be dug out in moderate, coarse, angular fragments that break readily into fine, angular blocks; firm when moist, plastic when wet; a few fine and medium roots; vertical cracks; fine and medium pores are numerous; pockets of silt; medium, hard concretions that are black internally are common; pH 4.2; gradual, wavy boundary.

C_g 49 to 61 inches +, silt loam; many fine and medium mottles of yellowish brown (10YR 5/4); massive; coarse clods break to fine and medium angular fragments; hard when dry; firm when moist, plastic when wet; a few root hairs; clods contain a few pores; a few clay balls, 3 inches in diameter, enclosing cores of silt loam; no hard concretions were noted; pH 4.0.

Profile of Caddo silt loam in woodland (SE¼NE¼ sec. 21, T. 14 S., R. 10 W.):

A_0 2 to 0 inch, leaf litter, not sampled.

A_1 0 to 3 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine and medium, subangular blocky structure; very friable; numerous roots up to 1 inch in diameter; a few pieces of fine quartz gravel; pH 5.0; clear, wavy boundary.

A_{2g} 3 to 13 inches, gray (10YR 6/1) heavy silt loam that has a few yellowish-brown spots associated with broken soft concretions; weak, coarse, subangular blocky structure; very friable; roots are common; medium sized, hard concretions that are black internally are common; a few rounded pieces of fine quartz gravel; pH 5.0; gradual, wavy boundary that has a few tongues into the horizon below.

B_{1g} 13 to 27 inches, gray (10YR 6/1) silt loam, about 10 percent of which consists of coarse mottles of yellowish brown (10YR 5/6) that extend through the aggregates; massive, but breaks readily to fine, angular blocky fragments; friable; a few roots; numerous pores in aggregates; many medium and coarse, hard concretions up to 2 inches in diameter, black internally; a few rounded pieces of fine quartz gravel; pH 4.9; diffuse, wavy boundary.

B_{2g} 27 to 42 inches, gray (10YR 6/1) silt loam; coarse, light yellowish-brown (10YR 6/4) mottles are common; coarse, angular blocky structure that breaks readily to fine, angular blocky fragments; somewhat friable, though tough and compact in places; numerous pores and a few fine roots; many hard concretions up to ½ inch in diameter, black internally; a few rounded pieces of fine quartz gravel; pH 5.0; diffuse boundary.

B_{3g} 42 to 55 inches, gray (10YR 6/1) silt loam; yellowish-brown (10YR 5/4) mottles are common; coarse, angular blocky structure that is easily broken to fine, angular blocky fragments; somewhat friable, though tough in places; contains a few subrounded masses of clay coated with silt; a few fine roots and many pores; hard concretions up to 2 inches in diameter and yellow throughout, and a few fine, hard concretions that are black internally; a few rounded pieces of fine quartz gravel; pH 5.2; diffuse, wavy and irregular boundary that has some tongues into the horizon below.

TABLE 9.—*Mechanical and chemical*

Soil and number of sample	Horizon	Depth	Size class and diameter of particles				
			Very coarse, coarse, and medium sand (2.0–0.25 mm.)	Fine sand (0.25–0.1 mm.)	Very fine sand (0.10–0.05 mm.)	Silt (0.05–0.002 mm.)	Clay (less than 0.002 mm.)
Myatt silt loam:							
S57–Ark–6–2(1–5)		*Inches*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
5714	A_g	0 to 8	0. 3	0. 6	4. 8	78. 9	15. 4
5715	B_{11g}	8 to 20	. 3	. 4	3. 6	76. 3	19. 4
5716	B_{12g}	20 to 35	. 3	. 3	3. 2	70. 4	25. 8
5717	B_{2g}	35 to 47	1. 5	1. 0	5. 8	59. 9	31. 8
5718	C_g	47 to 58+	. 2	. 3	3. 0	66. 3	30. 2
Myatt silt loam:							
S57–Ark–6–3(1–5)							
6376	A_{21g}	0 to 8	. 2	1. 8	6. 2	85. 4	6. 4
6377	A_{22g}	8 to 25	. 3	1. 4	5. 4	83. 4	9. 5
6378	B_{2g}	25 to 35	0	1. 1	4. 5	76. 0	18. 4
6379	B_{3g}	35 to 49	. 1	1. 0	4. 1	72. 8	22. 0
6380	C_g	49 to 61+	. 4	1. 0	3. 6	74. 8	20. 2
Caddo silt loam:							
S57–Ark–6–4(1–6)							
6381	A_1	0 to 3	14. 8	15. 0	9. 1	54. 3	6. 8
6382	A_{2g}	3 to 13	14. 0	13. 1	8. 1	55. 1	9. 7
6383	B_{1g}	13 to 27	11. 9	13. 5	8. 1	55. 7	10. 8
6384	B_{2g}	27 to 42	11. 1	11. 6	7. 4	56. 5	13. 4
6385	B_{3g}	42 to 55	11. 2	12. 3	7. 9	53. 5	15. 1
6386	C_g	55 to 62+	11. 0	13. 9	8. 6	46. 3	20. 2
Caddo silt loam:							
S57–Ark–6–5(1–6)							
6387	A_1	0 to 2	9. 7	11. 5	4. 0	67. 8	7. 0
6388	A_{2g}	2 to 13	10. 5	12. 1	4. 1	66. 2	7. 1
6389	B_{1g}	13 to 26	6. 5	8. 8	3. 0	61. 5	20. 2
6390	B_{2g}	26 to 40	9. 6	9. 4	3. 2	58. 6	19. 2
6391	B_{3g}	40 to 51	7. 6	9. 4	3. 2	51. 7	28. 1
6392	C_g	51 to 64+	10. 1	12. 2	4. 1	46. 1	27. 5

[1]Analyses by Soil Survey Laboratory, Soil Conservation Service, Lincoln, Nebr.

C_g 55 to 62 inches +, gray (10YR 6/1) loam, 25 percent of which consists of coarse mottles of yellowish brown (10YR 5/4); massive; firm but very compact and tough in places; a few pockets, less than 1 inch in diameter, of very fine sand; no roots or pores were observed; coarse hard concretions that are black internally are common; a few rounded pieces of fine quartz gravel; pH 5.1.

Profile of Caddo silt loam in woodland (NE¼SW¼ sec. 1, T. 14 S., R. 10 W.):

A_0 2 to 0 inch, leaf litter, not sampled.

A_1 0 to 2 inches, very dark grayish-brown (10YR 5/2) silt loam; weak, fine, subangular blocky structure; very friable; numerous roots and a few fine pores; a few rounded pieces of fine quartz gravel; pH 4.9; clear, wavy boundary.

A_{2g} 2 to 13 inches, gray (10YR 6/1) silt loam; common medium mottles of yellowish brown (10YR 5/4) and few fine, very dark grayish-brown (10YR 3/2) mottles; weak, fine, subangular blocky structure; friable; fine and medium roots are common; many concretions up to ½ inch in diameter, a few yellowish brown internally, but most of them black internally; numerous fine pores; a few rounded pieces of fine quartz gravel; pH 5.1; gradual, irregular boundary.

B_{1g} 13 to 26 inches, gray (10YR 6/1) silt loam in which medium-sized mottles of yellowish brown (10YR 5/4) permeate the clods; massive in place, but coarse, angular blocky when removed; clods break readily into fine, angular blocky fragments; contains pockets of silt; medium and large roots are common; aggregates contain numerous fine and medium pores; numerous medium-sized, hard concretions, yellowish brown internally; a few rounded pieces of fine quartz gravel; pH 4.8; diffuse boundary.

B_{2g} 26 to 40 inches, light brownish-gray (10YR 6/2) silt loam; the base color shades diffusely into medium-sized mottles of yellowish brown and pale brown; massive in place; clods are very friable but are very tough to break out from place; a few fine and medium roots; many fine pores; many medium-sized, hard concretions that are yellowish brown internally; a few silt pockets; a few rounded pieces of quartz gravel; pH 4.1; diffuse boundary.

B_{3g} 40 to 51 inches, gray (10YR 5/1) silty clay loam that has coarse blotches of yellowish brown (10YR 5/4) and a few vertical streaks of dark-gray clay; massive in place, but clods break readily to fine, angular blocky fragments; tough in place, very firm when moist, sticky and plastic when wet; a very few fine roots; no pores were observed; a few rounded pieces of fine gravel; medium-sized, hard concretions, yellowish brown internally, are common; pH 4.1; location of boundary is arbitrary.

C_g 51 to 64 inches +, gray (10YR 5/1) clay loam that has coarse blotches of yellowish brown (10YR 5/4) and a few vertical streaks of dark-gray clay; massive in place, but clods break easily to fine, angular blocky fragments; tough in place, very firm when moist, sticky and plastic when wet; a very few root hairs; no pores were observed; a few rounded pieces of fine quartz gravel; medium-sized, hard concretions, yellowish brown internally, are common; pH 4.2.

analyses of selected soils [1]

Organic carbon	Exchangeable cations					Sum of cations	Base saturation	Reaction
	Hydrogen	Calcium	Magnesium	Potassium	Sodium			
Percent	*meq. per 100 g.*	*meq. per 100 g.*	*meq. per 100 g.*	*meq. per 100 g.*	*meq. per 100 g.*	*meq. per 100 g.*	*Percent*	*pH*
0.82	7.0	1.2	1.1	0.2	0.1	9.6	27	5.0
.22	7.8	.6	.4	.1	.1	9.0	13	4.9
.12	10.9	.4	.6	.1	.3	12.3	11	5.0
.08	14.7	1.0	2.2	.1	1.9	19.9	26	4.4
.11	13.4	0	1.3	.1	.8	15.6	14	4.9
.35	3.1	.4	.2	0	0	3.7	16	4.8
.14	4.6	0	.4	0	.3	5.3	13	5.1
.08	9.8	0	.9	.1	1.0	11.8	17	4.4
.04	9.8	0	1.3	.1	1.7	12.9	24	4.2
.04	9.4	.8	1.7	.1	2.6	14.6	36	4.0
1.57	5.4	.8	.5	.1	0	6.8	20	5.0
.20	4.2	.5	.3	.1	0	5.1	18	5.0
.12	5.0	0	1.5	.1	.1	6.7	25	4.9
.05	6.2	0	.5	.1	.1	6.9	10	5.0
.05	7.0	0	.5	.1	.2	7.8	10	5.2
.03	9.4	0	1.1	.1	.4	11.0	14	5.1
1.69	5.0	1.4	.8	.1	0	7.3	32	4.9
.22	3.5	0	1.5	0	.1	5.1	31	5.1
.19	7.4	1.5	1.9	.1	1.4	12.3	40	4.8
.06	5.8	1.6	1.7	.1	4.0	13.2	56	4.1
.07	7.0	2.6	2.7	.1	5.4	17.8	61	4.1
.06	6.3	2.4	2.4	.1	4.6	15.8	60	4.2

Classification of Soils of the County

All three soil orders—zonal, intrazonal, and azonal—are represented in Bradley County. Zonal soils have well-developed, genetically related horizons that reflect the predominant influence of climate and living organisms during their formation. Intrazonal soils have well-developed, genetically related horizons, but the influence of topography or parent material dominates that of climate and living organisms. Azonal soils lack well-developed, genetically related horizons because there has not been sufficient time for such horizons to develop (*8, 10*).

Within the soil orders, soils are classified into great soil groups. The soils of Bradley County represent five great soil groups. Table 10 shows the soil order and great soil group of each soil series in the county and some of the factors that influenced soil development.

The zonal soils in Bradley County are the Boswell, Cahaba, Kalmia, Orangeburg, Prentiss, Ruston, Saffell, Savannah, Sawyer, Shubuta, and Wilcox soils. All of these series are in the Red-Yellow Podzolic great soil group.

In the Red-Yellow Podzolic soils, the A_1 horizon is lighter in color and coarser in texture than the A_0 horizon, and it has a higher content of organic matter than the A_2 horizon. The A_2 horizon is lighter in color than the horizon above or the one below. It has lost most of its clay minerals, iron, and aluminum. The B horizon is red or yellow in color, and it is finer in texture than the A_2 horizon. In most places the C horizon is lighter in color and coarser in texture than the B horizon.

Where the Red-Yellow Podzolic soils have been cultivated, the A_0 horizon has disappeared. The plow layer (A_p horizon) is a mixture of the A_1 and A_2 horizons. If the soil has been eroded, the A_p horizon may include material from the B horizon.

Although the Prentiss and Savannah soils are in the Red-Yellow Podzolic great soil group, they have a fragipan layer, which indicates that they are grading toward the Planosol great soil group.

The intrazonal soils of the county are the Leaf, Lewiston, Pheba, Stough, Lafe, Bibb, Caddo, Chastain, Myatt, and Tickfaw series. These series belong to the Planosol, Solonetz, and Low-Humic Gley great soil groups.

The Leaf, Lewiston, Pheba, and Stough soils are Planosols. The Leaf series has a claypan, which is a dense, heavy clay horizon in the profile. The Pheba, Lewiston, and Stough soils have a fragipan, a compact but not clayey layer that forms the lower part of the B horizon or lies immediately below it. The fragipan is very hard

TABLE 10.—*Classification of soil series of Bradley County, Ark., into higher categories, some factors of soil formation,[1] and degree of development*

ZONAL

Great soil group and series	Profile [2]	Slope range	Topographic position	Drainage	Parent material	Degree of profile development [3]
Red-Yellow Podzolic soils:		*Percent*				
Boswell	Dark grayish-brown to grayish-brown sandy loam surface soil; red to yellowish-red clay subsoil; mottled red, brown, and gray clay substratum.	1 to 20	Uplands	Moderately good.	Coastal Plain clays	Strong.
Cahaba	Dark grayish-brown to brown sandy loam surface soil; yellowish-red to reddish-brown sandy clay loam to sandy clay subsoil; may have substratum of sandy loam or sand below depth of 35 inches.	1 to 12	Stream terraces.	Good	Alluvium of sandy clay to sand washed from Coastal Plain material.	Strong.
Kalmia	Dark-brown to yellowish-brown sandy loam surface soil; yellowish-brown to brown sandy clay loam to sandy loam subsoil.	1 to 8	Stream terraces.	Moderately good.	Alluvium of sandy clay to sandy loam washed from Coastal Plain material.	Moderate.
Orangeburg	Brown to grayish-brown sandy loam surface soil; red to yellowish-red sandy clay loam subsoil; may have a substratum of sandy loam or sand below depth of 40 inches.	3 to 20	Uplands	Good	Coastal Plain sandy clay loams to sands.	Strong.
Prentiss	Dark grayish-brown to light brownish-gray sandy loam surface soil; yellow to yellowish-brown silty clay loam to sandy clay loam subsoil; contains a fragipan at depth of 20 to 36 inches.	0 to 12	Stream terraces.	Moderately good.	Alluvium of silty clay loam to sandy clay loam washed from Coastal Plain material.	Moderate.
Ruston	Grayish-brown to yellowish-brown sandy loam surface soil; reddish-yellow to yellowish-red sandy clay loam subsoil.	1 to 12	Uplands	Good	Coastal Plain sandy clay loams to sands.	Strong.
Saffell	Dark-gray to pale-brown gravelly sandy loam surface soil; yellowish-red to red gravelly sandy clay loam subsoil; may have a substratum of sand and gravel below depth of 45 inches.	3 to 25	Uplands	Good	Coastal Plain sandy clays, sands, and gravel.	Strong.
Savannah	Grayish-brown to yellowish-brown sandy loam surface soil; yellowish-brown sandy clay loam to sandy clay subsoil; contains a fragipan at a depth of 20 to 36 inches.	0 to 12	Uplands	Moderately good.	Coastal Plain sandy clays, silts, and sands.	Moderate.
Sawyer	Dark grayish-brown to yellowish-brown sandy loam surface soil; yellow to yellowish-red sandy clay loam subsoil; varicolored plastic clay substratum.	0 to 20	Uplands	Somewhat poor.	Coastal Plain clays to sandy clays, stratified with sand.	Moderate.
Shubuta	Dark grayish-brown to yellowish-brown sandy loam surface soil; yellowish-red to red sandy clay loam subsoil; varicolored sandy clay to clay substratum from a depth of 16 to 30 inches.	1 to 20	Uplands	Moderately good.	Coastal Plain clays, soft clay shales, and sandy clays.	Strong.
Wilcox	Dark-gray to grayish-brown silty clay loam surface soil; mottled red and gray plastic clay subsoil.	0 to 20+	Uplands	Somewhat poor.	Coastal Plain clays and soft clay shales.	Moderate.

See footnotes at end of table.

TABLE 10.—*Classification of soil series of Bradley County, Ark., into higher categories, some factors of soil formation,*[1] *and degree of development*—Continued

INTRAZONAL

Great soil group and series	Profile [2]	Slope range	Topographic position	Drainage	Parent material	Degree of profile development [3]
		Percent				
Planosols:						
Leaf	Gray to very dark gray silt loam surface soil; mottled gray, brown, and red clay subsoil; contains a claypan.	0 to 1	Stream terraces.	Poor	Alluvium of clays washed from Coastal Plain material.	Moderate to weak.
Lewiston	Gray to brown silt loam surface soil; mottled brown and gray silty clay loam subsoil; contains a fragipan at a depth of 18 to 36 inches.	0 to 3	Uplands	Somewhat poor.	Coastal Plain silts to silty clay loams with thin loess mantle.	Weak to moderate.
Pheba	Dark-gray to pale-brown very fine sandy loam to silt loam surface soil; mottled brown and gray sandy clay loam subsoil; contains a fragipan at a depth of 18 to 36 inches.	0 to 3	Uplands	Somewhat poor.	Coastal Plain sandy clay loams to silty clay loams.	Weak to moderate.
Stough	Yellowish-gray to yellowish-brown sandy loam surface soil; mottled yellow, brown, and gray silt to sandy clay loam subsoil; contains a fragipan at a depth of 12 to 40 inches.	0 to 3	Stream terraces.	Somewhat poor.	Alluvium of silts, sands, and clays washed from Coastal Plain material.	Weak to moderate.
Solonetz soils:						
Lafe	Thin, dark grayish-brown, very fine sandy loam surface soil; subsoil is about 10 inches of grayish-brown sandy clay loam over mottled brown and gray plastic clay and silty clay; substratum is loose sand at a depth of 36 to 50 inches.	0 to 1	Stream terraces.	Very poor	Alluvium of clays, silts, and sands washed from Coastal Plain materials.	Weak.
Low-Humic Gley soils:						
Bibb	Dark-gray to light-gray, mottled with brown, silt loam surface soil; gray, mottled with brown, silt loam to silty clay loam or clay subsoil.	0 to 1	Bottom lands.	Poor	Alluvium of clays, silts, and sands washed from Coastal Plain materials.	Weak.
Caddo	Dark grayish-brown to gray, mottled with brown, silt loam surface soil; gray, mottled with brown, silt loam to silty clay loam or sandy clay loam subsoil.	0 to 1	Uplands	Poor	Stratified Coastal Plain clays, silts, and sands.	Weak.
Chastain	Dark-gray to gray silty clay surface soil; gray, mottled with brown, red, and yellow, plastic clay subsoil.	0 to 1	Bottom lands.	Poor	Alluvium of clays, silts, and sands washed from Coastal Plain materials.	Weak.
Myatt	Dark-gray to gray silt loam surface soil; gray to pale-brown, mottled with brown, silt loam to silty clay subsoil.	0 to 1	Stream terraces.	Poor	Alluvium of clays, silts, and sands washed from Coastal Plain materials.	Weak.
Tickfaw	Dark grayish-brown to gray silt loam surface soil; mottled gray and brown silty clay subsoil.	0 to 1	Uplands	Poor	Stratified Coastal Plain clays, silts, and sands, with thin loess mantle.	Weak.

See footnotes at end of table.

TABLE 10.—*Classification of soil series of Bradley County, Ark., into higher categories, some factors of soil formation,[1] and degree of development*—Continued

AZONAL

Great soil group and series	Profile [2]	Slope range	Topographic position	Drainage	Parent material	Degree of profile development [3]
Alluvial soils:						
Iuka	Dark-brown to dark-gray silt loam surface soil; gray, mottled with brown and yellow, silt loam to silty clay subsoil; may have a substratum of stratified layers of clay or sandy clay below a depth of 16 inches.	0 to 1	Bottom lands.	Somewhat poor.	Alluvium of clays, silts, and sands washed from Coastal Plain materials.	Weak.
Mantachie	Dark-brown silt loam surface soil; yellowish-brown silt loam to silty clay loam subsoil which may have gray mottles at a depth of 12 to 30 inches.	0 to 1	Bottom lands.	Moderately good.	Alluvium of clays, silts, and sands washed from Coastal Plain materials.	Weak.
Ochlockonee	Dark-brown fine sandy loam surface soil; yellowish-brown fine sandy loam to silty clay loam subsoil mottled with gray between depths of 30 and 50 inches.	0 to 1	Bottom lands.	Good	Alluvium of clays, silts, and sands washed from Coastal Plain materials.	Weak.

[1] The effects of climate and vegetation on soils are relatively uniform in this county and do not account for the differences in the soils.
[2] These descriptions are of profiles not materially affected by accelerated erosion.
[3] The degree of development of horizons is sometimes used as a basis for estimating the length of time that a soil has been developing.

when dry but is friable when moist. It is high in silt or very fine sand and relatively low in clay.

The Lafe soil is tentatively classified in the Solonetz great soil group. The horizons of this soil have the general characteristics and the same sequence as those of solodized Solonetz soils, and the alkaline reaction in the lower part of the profile is similar. It seems highly probable, therefore, that the soil is high in exchangeable sodium in the deeper horizons.

The Bibb, Caddo, Chastain, Myatt, and Tickfaw series are Low-Humic Gley soils. All of them are poorly drained. They are moderate to low in organic-matter content. The surface layer (A_1 horizon) is thin and dark, and the lower horizons are gray or mottled. The Bibb and Chastain soils are on flood plains where the sediments have been in place for only a short time. The horizons in such soils are normally faint, reflecting small additions of organic matter and some reduction and transfer of iron.

The azonal soils in this county are the Iuka, Mantachie, and Ochlockonee series, all in the Alluvial great soil group. They lack distinct horizons because the sediments in which they are forming have been in place such a short time that distinct horizons have not had time to develop. They are located on flood plains where fresh sediments are deposited at frequent intervals.

General Nature of the Area

Physiography

All of Bradley County is on the forested Gulf Coastal Plain. The county is about 37 miles long from north to south, and its width varies from 24 miles down to zero at the southern tip.

The drainage is generally southward. Three main streams, the Saline River, Eagle Creek, and Moro Creek, run almost parallel from north to south, and all drain into the Ouachita River, which runs along the southwestern boundary of the county. The Saline River passes through the northeastern corner of the county and forms the boundary on the east and southeast. Eagle Creek runs through the center of the county, and Moro Creek forms the western boundary. Small tributary streams, including Steepbank Eagle, Brushy Eagle, Grassy Pond, Beech, Halfway, Charivari, Snake, and Tulip Creeks, drain the rest of the county.

There are 19 natural lakes. Pereogeethe Lake, which covers 55 acres, is the largest, and Greens Lake and Eagle Lake are next largest.

The county consists of rolling to hilly uplands, terraces or second bottoms, and flood plains or first bottoms. Elevations range from 335 feet on a ridge to 66.8 feet on bottom land (*2*).

The uplands lie in strips that vary from less than one mile to several miles in width and run from north to south between the drainage systems. They are nearly level to steep. Erosion varies from slight to severe.

The terraces occupy large areas in the southern half of the county. They lie between the uplands and the flood plains. They consist of gentle slopes and wide, flat, poorly drained areas locally called "flatwoods" or "pin oak flats." Little erosion occurs, even on the gentle slopes.

The wide, poorly drained flood plains lie along sluggish streams. They include some low, island-like ridges,

such as Greens Island and Hogpen Ridge, and many natural lakes formed by old river channels. Along the major streams there is a network of sloughs that overflow frequently, especially in winter and spring.

Climate

The climate of Bradley County is typical of the central part of the Gulf Coastal Plain. Table 11 shows data on temperature, precipitation, and snowfall from the U.S. Weather Bureau station at Warren.

The average annual rainfall is 51.91 inches. The rainstorms between November 1 and March 1 are gentle, and most of the water soaks into the ground. The soil moisture is near field capacity or above it much of the time from November 1 to April 1. More intense rainstorms and greater runoff are common during the rest of the year.

Droughty days—days on which well-drained soils have little or no available moisture in their uppermost 12 inches—are most common in September and October. Some droughty days can be expected in July and August. In some years, shallow-rooted crops are injured by drought in April, May, or June.

TABLE 11.—*Temperature and precipitation at Warren Station, Bradley County, Ark.*

[Elevation, 206 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1954)	Wettest year (1905)	Average snowfall
	°F.	*°F.*	*°F.*	*Inches*	*Inches*	*Inches*	*Inches*
December	45. 6	84	6	5. 76	2. 22	6. 67	0. 6
January	44. 9	82	−8	4. 87	6. 49	6. 51	1. 4
February	47. 7	88	5	4. 41	1. 76	3. 43	. 7
Winter	46. 0	88	−8	15. 04	10. 47	16. 61	2. 7
March	56. 0	95	12	5. 46	1. 95	10. 80	. 2
April	63. 8	93	28	5. 16	6. 71	10. 79	0
May	71. 6	101	34	4. 56	4. 17	6. 57	0
Spring	63. 8	101	12	15. 18	12. 83	28. 16	. 2
June	79. 4	110	47	3. 68	1. 33	7. 20	0
July	82. 4	110	52	3. 89	1. 52	9. 02	0
August	81. 9	111	52	3. 41	. 65	5. 99	0
Summer	81. 2	111	47	10. 98	3. 50	22. 21	0
September	76. 2	107	37	3. 38	1. 43	6. 07	0
October	64. 9	97	22	3. 17	1. 78	5. 28	0
November	53. 9	88	12	4. 16	3. 01	3. 54	. 1
Fall	65. 0	107	12	10. 71	6. 22	14. 89	. 1
Year	64. 0	111	−8	51. 91	33. 02	81. 87	3. 0

[1] Average temperature based on a 60-year record, through 1955; highest and lowest temperatures on a 52-year record, through 1952.

[2] Average precipitation based on a 60-year record, through 1955; wettest and driest years based on a 59-year record, in the period 1896–1955; snowfall based on a 53-year record, through 1952.

Wet soil is not uncommon in the spring, but in most years wetness does not interfere with spring planting. The dry weather of summer and fall is favorable for harvesting but less favorable for fall seeding and for the growth of the common pasture grasses and legumes.

The average frost-free period of 221 days extends from March 28 to November 4. Frosts have occurred as late in spring as April 26. Late frosts may damage such crops as tomatoes, and cotton may have to be replanted. In the autumn, frost has occurred as early as October 11, but little or no crop damage is caused by early frost.

Plant growth practically ceases during the cold part of the winter, but fall-sown oats remain green enough for grazing. The soil commonly freezes to a depth of 1 or 2 inches one to three times during the winter, but it seldom remains frozen for more than 3 or 4 days. Snow usually remains on the ground less than 4 days.

Temperatures rarely fall to 10° F. and seldom rise above 100° F. Very warm spells are common in summer and early in fall.

Vegetation

On the terraces and uplands, the original vegetation consisted principally of white oak, red oak, post oak, willow oak, hickory, gum, ash, shortleaf pine, and loblolly pine. On the bottom lands, the most common species were cypress, Nuttall oak, willow oak, water oak, hickory, elm, gum, pecan, maple, and hackberry. Two small prairies supported scattered clumps of stunted pine and post oak.

At the present time, about 85 percent of the county is covered with second-growth oak, hickory, gum, maple, shortleaf pine, and loblolly pine. The pines predominate in this woodland.

Water Supply

In most years the county has abundant water for livestock and for domestic use. The rivers furnish a constant supply of water.

In extremely dry years some of the smaller streams dry up. In 1954, the driest year on record, many small streams were dry for the first time in many years. Many shallow wells failed late in summer and early in fall of that year.

There are many small springs scattered over the county, but very few are dependable during a dry season. With the assistance of the Soil Conservation District, farmers built 493 stock ponds between 1940 and 1956.

Wildlife

Bradley County has an abundant supply of game animals and birds. Deer, squirrel, raccoon, fox, opossum, mink, dove, and quail are common, and there are a few wild turkeys. In 1956, 138 buck deer were killed in the county.

Most of the ponds, rivers, and natural lakes have been restocked with bass and bluegill bream by the Arkansas Game and Fish Commission and the United States Fish and Wildlife Service. The fish most common in the

waters of the county are bream, buffalo fish, carp, catfish, drumfish, sucker, gar, bass, and crappie.

Organization and Population

Bradley County was first settled between 1825 and 1840. Most of the early settlers were from Virginia, Georgia, North Carolina, and South Carolina. They cleared small tracts of land near the Saline River, just east of the present town of Warren. Later settlers took land on the uplands. The county was organized on December 18, 1840. In 1873 part of its territory was taken to make Cleveland County.

In 1950 the population of the county was 15,987. About 65 percent of the population live in rural areas. Warren, with a population of 2,615, is the county seat. Bradley Quarters, although unincorporated, is part of the Warren urban area and had a population of 2,880 in 1950. Other towns are Hermitage, with 398 people, and Banks, with 240. A few unincorporated towns and trading centers, such as Ingalls, Vick, Morobay, Jersey, Gravelridge, and Johnsville, are scattered over the county.

Industry

Timber is the chief basis of industry in this county. Two large lumber mills are located at Warren, and a smaller mill is located at Hermitage. Other industries that depend on the timber resources are a flooring mill, a furniture factory, a hickory or handle mill, and a wood-treating plant.

The county also has five cotton gins, a meat and poultry processing plant, two livestock sale barns, three tomato packing sheds, an ice plant, and a ready-mix cement plant.

Transportation

A branch line of the Missouri Pacific Railroad connects Warren with the main line at Dermott, in Chicot County. A branch line of the Chicago, Rock Island and Pacific Railroad runs diagonally across the county through the towns of Banks and Hermitage. The Warren and Ouachita Valley Railway runs from Warren to Banks, linking the Missouri Pacific and the Chicago, Rock Island and Pacific Railroads. The Warren and Saline River Railroad is used to haul logs between Warren and Hermitage.

State Highways Nos. 4, 8, and 15 are hard-surfaced roads into Warren. The roads between Warren and Banks and between Warren and Hermitage are hard surfaced. Other roads in the county are being improved.

Farms of the County

About 85 percent of this county is in woodland, and more than half of this is owned by commercial timber companies or large lumber mills. General farming is on the higher ridges and on some of the better drained stream terraces and bottom lands. The most common crops are cotton, corn, hay, and tomatoes. The number of cattle, dairy, poultry, and vegetable farms has increased noticeably in recent years.

The amount of land in farms has been decreasing for a number of years. In 1940 there were 1,440 farms in the county, covering 122,006 acres. By 1954 there were only 1,092 farms, covering 96,727 acres. Of the farms in the county in 1954, 105 were from 1 to 9 acres in size; 142 from 10 to 29 acres; 233 from 30 to 49 acres; 314 from 50 to 99 acres; 288 from 100 to 219 acres; and 66 from 220 to 999 acres; and 4 farms were more than 1,000 acres in size. The average size was 88.6 acres, a slight increase over the average size of 84.7 acres in 1940.

In 1940, 42,353 acres of the land in farms was harvested for cropland, but in 1954, only 18,807 acres was reported as cropland harvested. The acreage in cotton was reduced considerably during these years—from 16,043 acres in 1939 to 6,815 acres in 1954. The acreage in corn was likewise reduced from 17,232 acres in 1939 to 5,122 acres in 1954. The acreage in tomatoes increased from 208 to 673, and the acreage in lespedeza hay increased from 1,191 in 1939 to 2,232 in 1954. Between 1940 and 1954, the number of cattle and calves increased from 2,052 to 3,640. The number of hogs and pigs decreased from 14,915 to 5,680 during the same years.

Glossary

AASHO.—American Association of State Highway Officials.

Acidity.—(See Reaction).

Aggregate, soil.—A mass or cluster of many fine soil particles held together, such as a granule, clod, block, or prism.

Alluvium.—Sand, mud, and other sediments deposited on land by streams. Local alluvium came from nearby areas. General alluvium came from extensive areas some distance up the stream.

Available water-holding capacity.—The difference between the percentage of water held in the soil at field capacity and the percentage of water held in the soil at the wilting point. This difference determines the amount of water that plants will be able to use.

Blocky.—(See Structure, soil).

Board foot.—The amount of wood in a board 1 foot wide, 1 foot long, and 1 inch thick; 144 cubic inches, or 1/12 cubic foot.

Clay.—A soil separate or size group of mineral particles less than 0.002 mm. in diameter. Clay as a textural class consists of soil material that contains more than 40 percent clay, less than 45 percent sand, and less than 40 percent silt.

Claypan.—A layer or horizon of accumulation, or a stratum of stiff, compact, and relatively impervious clay, more compact or more fine textured than the layers above.

Complex, soil.—An association in which two or more soils are so intricately intermixed that it is not practical to show them separately at the scale of mapping used.

Consistence, soil.—The degree and kind of cohesion and adhesion or the resistance to deformation or rupture of the soil aggregates. Terms commonly used to describe consistence are as follows:

Compact.—Dense and firm, but without any cementation.

Firm.—Soil material crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Friable.—Soil material crushes easily under gentle to moderate pressure between thumb and forefinger, and coheres when pressed together.

Hard.—Moderately resistant to pressure; can be broken in the hands without difficulty, but can barely be broken between thumb and forefinger.

Plastic.—Soil material forms wirelike shape when rolled between thumb and forefinger, and moderate pressure is required to deform the soil mass.

Sticky.—After pressure, soil material adheres to both thumb and forefinger, and tends to stretch somewhat and pull apart rather than to pull free from the skin.

Contour tillage.—Furrows plowed at right angles to the direction of slope, at the same level throughout, and ordinarily at reasonably close intervals.

Controlled burning.—Deliberate use of fire, in which the burning is restricted to a predetermined area and intensity.

Cord.—A unit of measurement of wood. The standard cord is a pile of wood 8 feet long by 4 feet high, made up of sticks 4 feet long.

Crop rotation.—The growing of different crops in recurring succession on the same field.

Cropland.—Land regularly used for crops, except forest crops. It includes rotation pasture, cultivated summer fallow, and land that is temporarily idle.

Cutting cycle.—In woodland management, the planned interval between major felling operations in the same stand. In Bradley County, the cutting cycle is generally 6 to 8 years.

Doyle rule.—A rule for determining the number of board feet in a log.

Drainage, soil.—The relative rapidity and extent of removal of water from on and within the soil, under natural conditions. Terms commonly used to describe drainage are as follows:

Very poorly drained.—Water is removed so slowly that the soil remains wet most of the time, and water ponds on the surface frequently. The water table is at the surface most of the time.

Poorly drained.—Water is removed so slowly that the soil remains wet for a large part of the time. The water table is commonly at or near the surface during a considerable part of the year.

Somewhat poorly drained.—Water is removed slowly enough so the soil is wet for significant periods but not all of the time.

Moderately well drained.—Water is removed somewhat slowly, and the soil is wet for a small but significant part of the time.

Well drained.—Water is removed readily but not rapidly. A well-drained soil has good drainage.

Somewhat excessively drained.—Water is removed so rapidly that only a relatively small part is available to plants. Only a narrow range of crops can be grown, and yields are usually low without irrigation.

Excessively drained.—Water is removed very rapidly. Enough precipitation commonly is lost to make the soil unsuitable for ordinary crops.

Erosion.—The wearing away of the land surface by detachment and transport of soils and rock materials through the action of moving water, wind, and other geological agents. Terms used in this report to describe eroded soils are as follows:

Slightly eroded.—The soil has lost up to 25 percent of the original surface soil, but the plow layer consists almost entirely of material of the original surface soil. If the name of the mapping unit does not mention erosion, the soil is slightly eroded.

Moderately eroded.—The soil has lost from 25 to 75 percent of the original surface layer. The subsoil material is within plow depth over half or more of the area, and the surface soil and subsoil material are mixed in the plow layer. Some shallow gullies may be present. If the name of the mapping unit includes the word "eroded," the soil is moderately eroded.

Severely eroded.—The soil has lost all or nearly all of the original surface layer. Tillage is almost entirely in subsoil material. Short, shallow gullies are common, and a few gullies may be too deep to be filled in by ordinary tillage. If "severely eroded" is in the name of the mapping unit, the soil is in this erosion class.

Gullied.—The soil has been so eroded that much of the profile has been destroyed. The areas consist of an intricate pattern of gullies. Reclamation would be very slow.

Fertility.—The quality that enables a soil to provide the proper compounds, in proper quantities and balance, for the growth of specified plants when light, temperature, moisture, physical condition of the soil, and other factors are favorable.

Field capacity.—The amount of moisture that the soil will hold against the forces of gravity; the water left after runoff and downward internal drainage have ceased.

First bottom.—The normal flood plain of a stream, subject to frequent or occasional flooding.

Forest rotation.—The period of years required to establish and grow timber crops to a specified condition of maturity. In Bradley County, the rotation age of trees is generally 50 to 75 years.

Fragipan.—A very compact horizon, rich in silt, sand, or both, and usually relatively low in clay. It commonly interferes with penetration of roots and water. When dry the material appears to be cemented, but when moist the apparent cementation disappears.

Granular.—(See Structure, soil).

Gravelly.—Containing rounded and subrounded fragments of rock up to 3 inches in diameter.

Green-manure crop.—Any crop grown and plowed under while green for the purpose of improving the soil.

Horizon, soil.—A layer of soil, approximately parallel to the soil surface, with characteristics produced by soil-forming processes.

Horizon A.—The horizon at the surface. It contains organic matter, or it has been leached of soluble minerals and clay, or it shows the effects of both. The A_0 horizon is not a part of the mineral soil but the accumulation of organic debris on the surface. The major A horizon may be subdivided into A_1, the part that is darkest in color because it contains organic matter, and A_2, the part that is the most leached and the lightest colored layer in the profile. The subdivisions may be further divided by adding another number, such as A_{21} and A_{22}. If the upper layers of the soil are thoroughly mixed by cultivation, this plow layer is called the A_p horizon. The $_g$ added to some horizons means that the material is gleyed, or shows the effects of waterlogging.

Horizon B.—The horizon in which minerals, clay, or other material has accumulated, or which has developed a characteristic blocky or prismatic structure, or which shows the characteristics of both processes. It may be subdivided into B_1, B_2, or B_3 horizons. These may be further divided by adding another number to the symbol, such as B_{11}, B_{12}, B_{21}, or B_{22} horizons. Other subscripts that may be added are $_g$ to indicate gleying, $_m$ to indicate a massive horizon or fragipan, and $_{ca}$ to indicate an accumulation of calcium carbonate.

Horizon C.—The unconsolidated material immediately under the true soil. It is presumed to be similar in chemical, physical, and mineral composition to the material from which at least part of the overlying soil has developed.

Horizon D.—The stratum beneath the parent material.

Internal drainage.—The movement of water through the soil profile. The rate of movement is affected by the texture, structure, and other characteristics of the surface soil and subsoil, and by the height of the water table, either permanent or perched. Terms for expressing internal drainage are as follows:

None.—No free water passes through the soil mass.

Very slow.—Movement of water through the soil is much too slow for good growth of most important crops.

Slow.—Movement of water through the soil is faster than in very slow drainage, but not so fast as in medium drainage.

Medium.—Movement of water through the soil is about right for good growth of most of the important crops.

Rapid.—Movement of water through the soil is somewhat faster than is best for the growth of most important crops.

Very rapid.—Movement of water through the soil is too rapid for good growth of most of the important crops.

Leaching, soil.—The removal of materials in solution by percolating water.

Loam.—Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Loess.—A geological deposit of fairly uniform fine material, mostly silt, presumably laid down by wind.

Mapping unit.—Any soil, miscellaneous land type, soil complex, or undifferentiated soil group shown on the detailed soil map and identified by a letter symbol.

Massive.—(See Structure, soil).

Mottled.—Marked with spots of color and usually associated with poor drainage. Descriptive terms for mottles are as follows: Contrast—faint, distinct, and prominent; abundance—few, common, and many; and size—fine, commonly less than 5 mm. (about 0.2 inch) in diameter along the greatest dimension; medium, commonly ranging between 5 and 15 mm. (about 0.2 to 0.6 in.) along the greatest dimension; and coarse, commonly more than 15 mm. (about 0.6 in.) along the greatest dimension (*6, 11*).

Nonplastic.—When wet, soil cannot be formed into the shape of a wire.

Nutrient, plant.—Any element taken in by a plant, essential to its growth and used by it in elaboration of its food and tissue. Essential nutrients include nitrogen, phosphorus, calcium, potassium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and other elements mainly from the soil; and carbon, hydrogen, and oxygen, largely from the air and water.

Optimum moisture content.—The moisture content at which a soil material yields the highest dry density in the standard or modified test for optimum moisture and maximum dry density.

Parent material.—The mass of unconsolidated material from which the soil profile develops.

Ped.—An individual natural soil aggregate, such as a granule, a prism, or a block.

Perched water table.—A layer of saturation in the soil, separated from the true ground water table and held above it by a layer of impervious material.

Percolation.—The downward movement of water through the soil, especially the downward flow of water in saturated or nearly saturated soil.

Permeability, soil.—That quality of the soil that enables it to transmit water and air. Rates of permeability are expressed in inches of water per hour. Relative classes of soil permeability are very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid.

pH.—A term used to indicate the acidity and alkalinity of soils. (See Reaction.)

Prismatic.—(See Structure, soil.)

Poorly graded.—In engineering, describes material, either coarse or fine, that is all of the same size.

Productivity, soil.—The present capacity of a soil to produce a specified plant or sequence of plants under a defined set of management and practices.

Profile, soil.—A vertical section of the soil, from the surface into the parent material.

Reaction, soil.—The degree of acidity or alkalinity of the soil mass expressed in pH values or in words as follows:

	pH		*pH*
Extremely acid	below 4.5	Mildly alkaline	7.4–7.8
Very strongly acid	4.5–5.0	Moderately alkaline	7.9–8.4
Strongly acid	5.1–5.5	Strongly alkaline	8.5–9.0
Medium acid	5.6–6.0	Very strongly alkaline	9.1 and higher.
Slightly acid	6.1–6.5		
Neutral	6.6–7.3		

Relief.—The elevations or inequalities of the land surface, the slope gradient, and the pattern of these, considered collectively.

Row direction.—Plowing rows in a direction to obtain maximum benefit from the natural gradient to drain excess water from a field. Practiced, either alone or in conjunction with a designed drainage system, on fields with slopes of less than 1 percent.

Runoff.—The rate at which water is removed by flow over the surface of the soil. The rapidity of runoff and the amount of water removed is closely related to slope and is also affected by factors such as texture, structure, and porosity of the surface soil; the vegetative covering; and the prevailing climate. Relative degrees of runoff are as follows:

Ponded.—None of the water added to the soil as precipitation or by flow from surrounding higher land escapes as runoff. Removal is by movement through the soil or by evaporation.

Very slow.—Surface water flows away so slowly that free water lies on the surface for long periods or enters immediately into the soil. Very little of the water is removed by runoff.

Slow.—Surface water flows away so slowly that free water covers the soil for significant periods or enters the soil so rapidly that only a small amount is removed as runoff. Normally, there is little or no erosion hazard.

Medium.—Surface water flows away at such a rate that a moderate proportion of the water enters the soil profile, and free water lies on the surface for only short periods. The loss of water over the surface does not reduce seriously the supply available for plant growth. This commonly is considered good external drainage. The erosion hazard may be slight to moderate if soil of this class is cultivated.

Rapid.—A large proportion of the precipitation moves rapidly over the surface of the soil and a small part moves through the soil profile. The erosion hazard commonly is moderate to high.

Very rapid.—A very large part of the water moves rapidly over the surface of the soil and a very small part goes through the profile. The erosion hazard is commonly high or very high.

Sand.—A soil separate ranging from 2.0 millimeters to 0.05 millimeter in diameter. As a textural class, soil material that contains 85 percent or more sand, and a percentage of silt that, added to 1½ times the percentage of clay, does not exceed 15.

Sandy loam.—Soil material that contains 20 percent or less clay, 52 percent or more sand, and a percentage of silt that, added to twice the percentage of clay, exceeds 30; or soil material that contains less than 7 percent clay, less than 50 percent silt, and between 43 and 52 percent sand.

Series, soil.—A group of soils that, except for the texture of their surface soil, are similar in profile characteristics and in horizon arrangement. The soils of one series have developed from a particular type of parent material. A series may include two or more soil types, which differ primarily in texture of the surface soil.

Shrink-swell potential.—An indication of the volume change to be expected of the soil material, caused by changes in moisture content.

Silt.—A soil separate ranging from 0.05 millimeter to 0.002 millimeter in diameter. Silt as a textural class consists of soil material that contains 80 percent or more silt and less than 12 percent clay.

Silt loam.—Soil material that contains 50 percent or more silt and 12 to 27 percent clay; or soil material that contains 50 to 80 percent silt and less than 12 percent clay.

Silty clay.—Soil material that contains 40 percent or more clay and 40 percent or more silt.

Silty clay loam.—Soil material that contains 27 to 40 percent clay and less than 20 percent sand.

Single grained.—(See Structure, soil).

Site index.—The average height of the dominant and codominant trees of a given species at the age of 50 years on a given soil.

Slope classes.—As used in this report, they are as follows:

	Percent of slope
Level	0 to 1
Nearly level	1 to 3
Gently sloping	3 to 8
Sloping	8 to 12
Moderately steep	12 to 20
Steep	More than 20

Soil.—The natural medium for the growth of land plants. It is characterized by layers resulting from modification of the parent material by physical, chemical, and biological forces over periods of time.

Soil separates.—The individual size groups of mineral particles; sand, silt, and clay.

Solodization.—The process of gradual change from a Solonetz soil to a more acid soil typical of the climate of the region, usually due to an improvement in drainage of the soil. In solodization, the clay is leached downward from the A horison, which becomes lighter in color and coarser in texture; the A horizon becomes thicker as the B horizon becomes thinner; and the general reaction gradually shifts from alkaline to acid.

Solum.—The part of the soil profile, above the unweathered parent material, in which the processes of soil formation are active. In mature soils the solum includes the A and B horizons.

Structure, soil.—The arrangement of individual soil particles into clusters or aggregates that are separated from adjoining aggregates by surfaces of weakness. Structure is classified by grade, class, and type.

Grade.—The distinctness and durability of the aggregates. It is expressed as weak, moderate, or strong. Soil that has no visible structure is termed *massive* if it is coherent, or *single grain* if it is noncoherent.

Class.—The size of the aggregates. It is expressed as very fine, fine, medium, coarse, and very coarse.

Type.—The shape and arrangement of the aggregates. *Prismatic* structure has the soil particles arranged in a column whose vertical surfaces are relatively flat. *Granular* structure has the soil particles arranged in a roughly spherical shape, whose surfaces are irregular and not shaped by the adjoining aggregates. *Blocky* structure has the soil particles arranged in a roughly spherical shape, whose surfaces are molded by the surrounding aggregates. If the surfaces are flat, the structure is angular blocky; if they are rounded, the structure is subangular blocky.

Stumpage value.—The value of timber as it stands uncut in the woods.

Subsoil.—Technically, the B horizon of a soil with a distinct profile; in soils with weak profile development, the soil below the surface soil in which roots normally grow. Roughly, that part of the profile below plow depth.

Substratum.—Any layer beneath the solum or true soil.

Surface soil.—Technically, the A horizon of a soil with a distinct profile; roughly, that part of the profile usually stirred by plowing.

Terrace, agricultural.—An embankment or ridge constructed across sloping soils, on or approximately on contour lines, at specific intervals. The terrace intercepts runoff and holds it for soaking into the soil or directs the excess water to an outlet.

Terrace, geological.—An old alluvial plain, often called a second bottom, that now lies above the present first bottom as a result of entrenchment of the stream; seldom subject to flooding.

Texture, soil.—The relative proportion of the various size groups of individual soil grains in a mass of soil. A coarse-textured soil is high in content of sand; a fine-textured soil has a large proportion of clay.

Tilth, soil.—The ease with which a soil can be tilled; the physical conditions which fit it for the growth of crops.

Upland, geologic.—Land consisting of material not worked by water within recent geologic time, generally lying at a higher elevation than the bottom lands and stream terraces.

Water table.—The upper limit of the part of the soil or underlying rock material that is wholly saturated with water.

Well graded.—In engineering, describes material that contains proper proportions of all size classes of particles for best stability.

Wilting point.—The moisture content at which the soil contains so little water that a plant can no longer extract any for its own use.

Woodland.—Land bearing a stand of trees of any age or size, including seedlings, of species that average at least 6 feet tall at maturity; or land from which such a stand has been removed, but which has been put to no other use.

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GUIDE TO MAPPING UNITS, CAPABILITY UNITS, AND WOODLAND SUITABILITY GROUPS

[See table 1, p. 12, for estimated crop yields; see table 3, p. 18, for estimated woodland yields; see table 6, p. 24, for information that is significant to engineering; and for the approximate acreage and proportionate extent of each soil, see table 8, p. 36.]

Map symbol	*Mapping unit*	*Page*	*Capability unit*	*Page*	*Woodland suitability group*	*Page*
Bb	Bibb silt loam	34	Vw-1	10	6	17
BwC	Boswell very fine sandy loam, gently sloping phase	34	IIIe-3	7	2	16
BwB	Boswell very fine sandy loam, nearly level phase	35	IIe-2	6	2	16
BwB2	Boswell very fine sandy loam, eroded nearly level phase	35	IIIe-3	7	2	16
BwC2	Boswell very fine sandy loam, eroded gently sloping phase	35	IIIe-3	7	2	16
BoC3	Boswell sandy clay, severely eroded gently sloping phase	35	IVe-3	9	2	16
BwE	Boswell very fine sandy loam, 8 to 20 percent slopes	35	VIIe-2	10	2	16
BgB	Boswell gravelly fine sandy loam, nearly level phase	36	IIe-2	6	2	16
BgC	Boswell gravelly fine sandy loam, gently sloping phase	37	IIIe-3	7	2	16
BgC2	Boswell gravelly fine sandy loam, eroded gently sloping phase	37	IIIe-3	7	2	16
CT	Caddo and Tickfaw silt loams	37	IIIw-1	8	3	16
CaC	Cahaba sandy loam, gently sloping phase	38	IIIe-1	7	5	17
CaB	Cahaba sandy loam, nearly level phase	38	IIe-3	6	5	17
CaC2	Cahaba sandy loam, eroded gently sloping phase	38	IIIe-1	7	5	17
CaD	Cahaba sandy loam, sloping phase	38	IVe-1	8	5	17
Ch	Chastain silty clay	39	Vw-1	10	7	18
Gu	Gullied land	39	VIIe-1	10	7	18
IM	Iuka-Mantachie silt loams	39	I-1	5	6	17
KaB	Kalmia fine sandy loam, nearly level low terrace phase	40	IIe-3	6	5	17
KaC	Kalmia fine sandy loam, gently sloping low terrace phase	40	IIIe-1	7	5	17

GUIDE TO MAPPING UNITS, CAPABILITY UNITS, AND WOODLAND SUITABILITY GROUPS—Continued

Map symbol	*Mapping unit*	*Page*	*Capability unit*	*Page*	*Woodland suitability group*	*Page*
La	Lafe very fine sandy loam	41	VIIs-1	11	7	18
Le	Leaf silt loam	41	IIIw-1	8	3	16
Ma	Mixed alluvial land	42	Vw-1	10	6	17
Mb	Myatt silt loam	42	IIIw-1	8	3	16
MK	Myatt-Kalmia complex, mound phase	42	IIIw-1	8	3	16
Oc	Ochlockonee fine sandy loam	43	I-1	5	6	17
OfC2	Orangeburg fine sandy loam, eroded gently sloping phase	43	IIIe-1	7	5	17
OfC	Orangeburg fine sandy loam, gently sloping phase	43	IIIe-1	7	5	17
OfD	Orangeburg fine sandy loam, sloping phase	44	IVe-1	8	5	17
ORE	Orangeburg and Ruston fine sandy loams, moderately steep phases	44	VIe-1	10	5	17
PLB	Pheba and Lewiston soils, nearly level phases	44	IIw-1	6	3	16
PLA	Pheba and Lewiston soils, level phases	45	IIw-1	6	3	16
PLB2	Pheba and Lewiston soils, eroded nearly level phases	45	IIw-1	6	3	16
PrC	Prentiss very fine sandy loam, gently sloping phase	45	IIIe-2	7	4	17
PrA	Prentiss very fine sandy loam, level phase	45	I-2	5	4	17
PrB	Prentiss very fine sandy loam, nearly level phase	45	IIe-1	5	4	17
PrB2	Prentiss very fine sandy loam, eroded nearly level phase	46	IIe-1	5	4	17
PrC2	Prentiss very fine sandy loam, eroded gently sloping phase	46	IIIe-2	7	4	17
PrD	Prentiss very fine sandy loam, sloping phase	46	IVe-2	9	4	17
Ps	Prentiss very fine sandy loam, mound phase	46	IIIe-2	7	4	17
Ps2	Prentiss very fine sandy loam, eroded mound phase	46	IIIe-2	7	4	17
RuC	Ruston fine sandy loam, gently sloping phase	46	IIIe-1	7	5	17
RuB	Ruston fine sandy loam, nearly level phase	47	IIe-3	6	5	17
RuC2	Ruston fine sandy loam, eroded gently sloping phase	47	IIIe-1	7	5	17
RyC3	Ruston sandy clay loam, severely eroded gently sloping phase	47	IVe-1	8	5	17
RuD	Ruston fine sandy loam, sloping phase	47	IVe-1	8	5	17
SaC	Saffell gravelly fine sandy loam, gently sloping phase	47	IIIe-1	7	5	17
SaC2	Saffell gravelly fine sandy loam, eroded gently sloping phase	48	IIIe-1	7	5	17
SaC3	Saffell gravelly fine sandy loam, severely eroded gently sloping phase	48	VIe-1	10	5	17
SaD	Saffell gravelly fine sandy loam, sloping phase	48	IVe-1	8	5	17
SaD2	Saffell gravelly fine sandy loam, eroded sloping phase	48	IVe-1	8	5	17
SaE	Saffell gravelly fine sandy loam, 12 to 25 percent slopes	48	VIIe-1	10	5	17
SdC	Savannah very fine sandy loam, gently sloping phase	49	IIIe-2	7	4	17
SdA	Savannah very fine sandy loam, level phase	49	I-2	5	4	17
SdB	Savannah very fine sandy loam, nearly level phase	49	IIe-1	5	4	17
SdB2	Savannah very fine sandy loam, eroded nearly level phase	49	IIe-1	5	4	17
SdC2	Savannah very fine sandy loam, eroded gently sloping phase	49	IIIe-2	7	4	17
SdD	Savannah very fine sandy loam, sloping phase	50	IVe-2	9	4	17
SfB2	Sawyer very fine sandy loam, eroded nearly level phase	50	IIIe-3	7	4	17
SfA	Sawyer very fine sandy loam, level phase	50	IIe-2	6	4	17
SfB	Sawyer very fine sandy loam, nearly level phase	50	IIe-2	6	4	17
SfC	Sawyer very fine sandy loam, gently sloping phase	50	IIIe-3	7	4	17
SfC2	Sawyer very fine sandy loam, eroded gently sloping phase	51	IIIe-3	7	4	17
SfE	Sawyer very fine sandy loam, moderately steep phase	51	VIe-2	10	4	17
ShB2	Shubuta fine sandy loam, eroded nearly level phase	51	IIe-2	6	4	17
ShC2	Shubuta fine sandy loam, eroded gently sloping phase	51	IIIe-3	8	4	17
ShE	Shubuta gravelly fine sandy loam, moderately steep phase	51	VIe-2	10	4	17
StB	Stough very fine sandy loam, nearly level phase	52	IIw-1	6	3	16
StA	Stough very fine sandy loam, level phase	52	IIw-1	6	3	16
SK	Stough-Kalmia complex, mound phase	52	IIIw-2	8	3	16
WcC	Wilcox silty clay loam, gently sloping phase	53	IVe-3	9	1	16
WcA	Wilcox silty clay loam, level phase	53	IIIw-1	8	1	16
WcB	Wilcox silty clay loam, nearly level phase	53	IIIe-3	8	1	16
WcC2	Wilcox silty clay loam, eroded gently sloping phase	53	IVe-3	9	1	16
WcE	Wilcox silty clay loam, moderately steep phase	53	VIIe-2	10	1	16
WcF	Wilcox silty clay loam, steep phase	53	VIIe-2	10	1	16

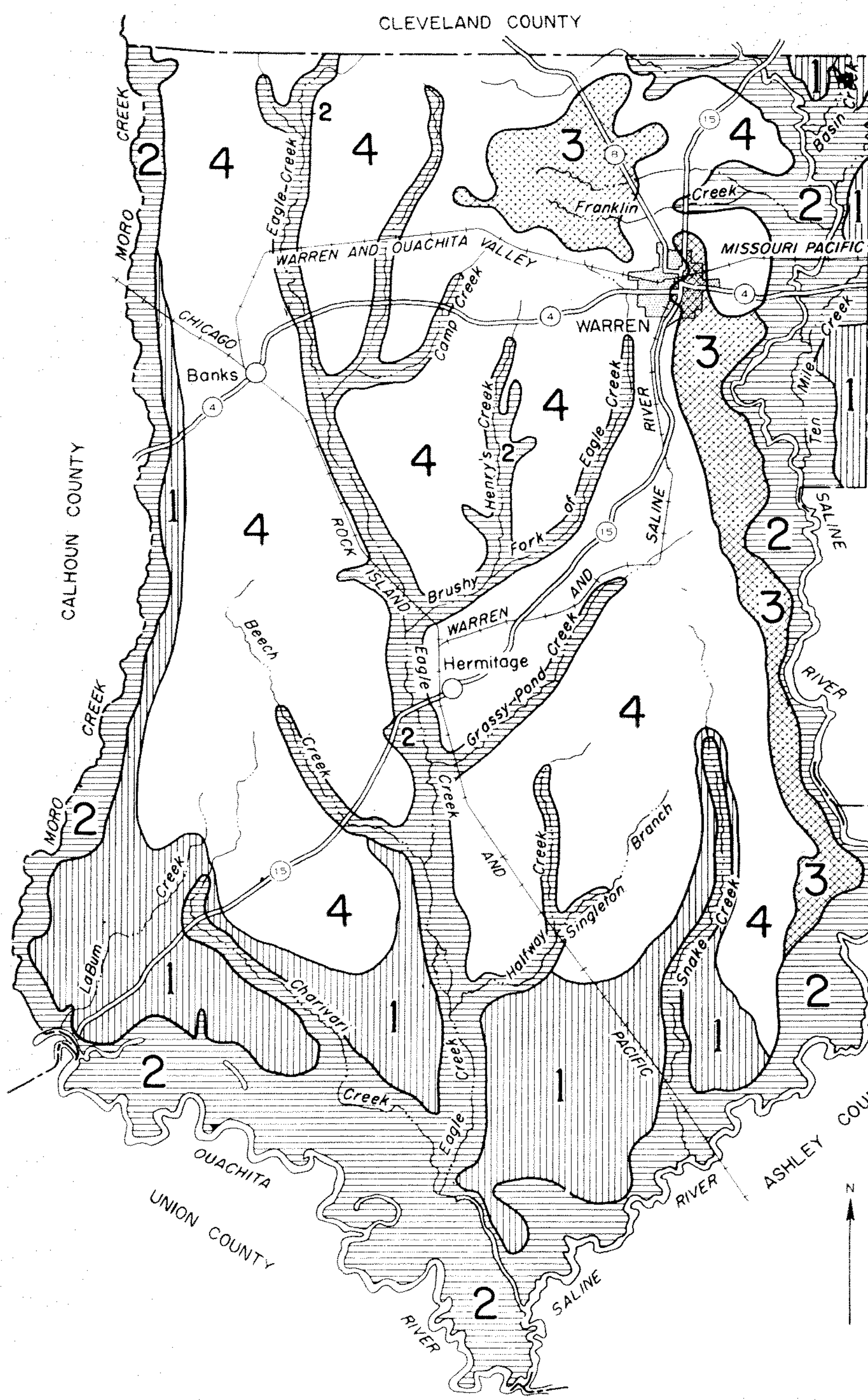
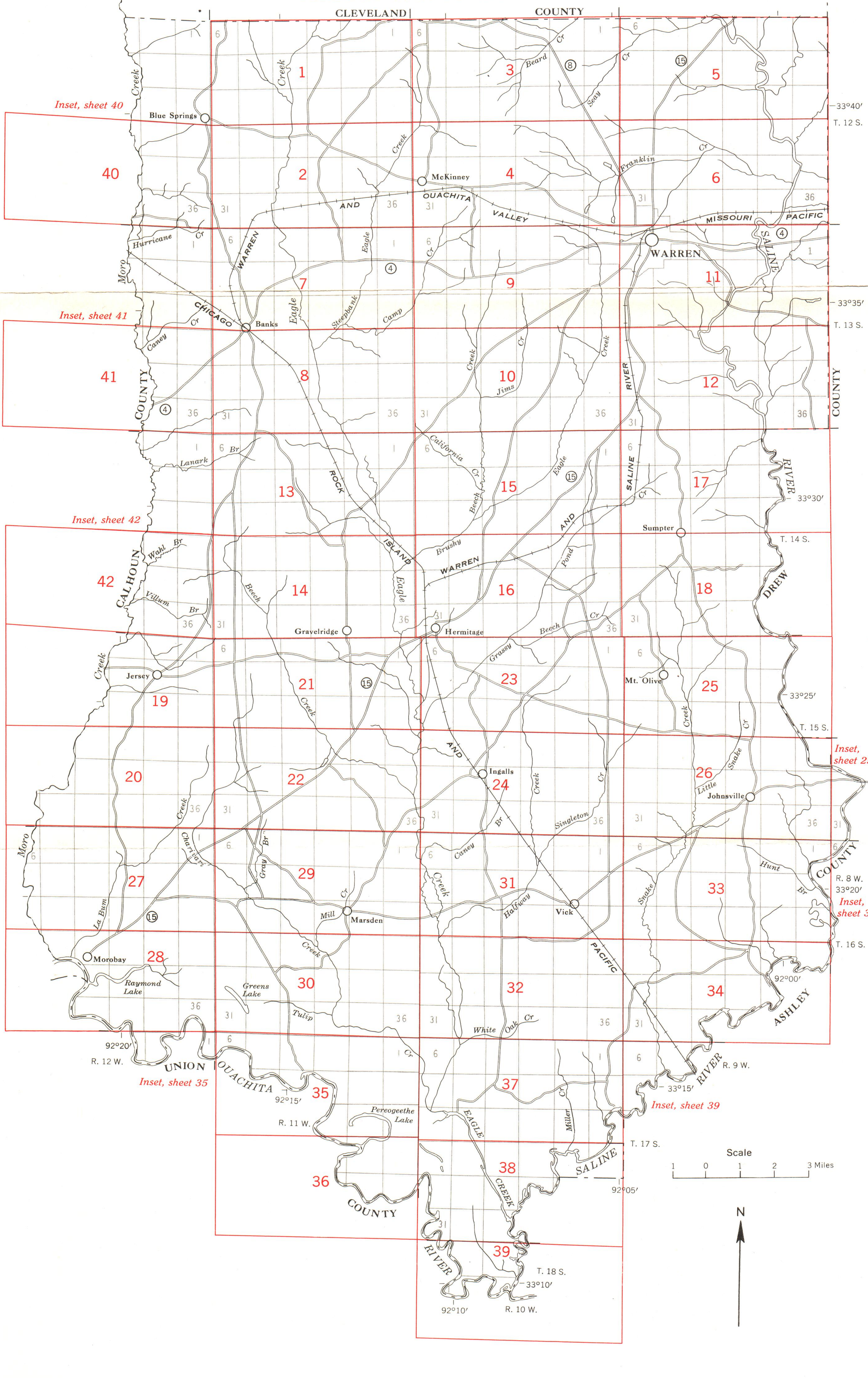


Figure 2.—General soil areas.

1. Myatt-Stough-Prentiss: Poorly drained to moderately well drained, level to nearly level soils on stream terraces.
2. Bibb-Ochlockonee-Chastain: Poorly drained to well drained soils on bottom lands.
3. Wilcox-Boswell: Nearly level to moderately steep soils that have heavy clay subsoil, on uplands.
4. Savannah-Ruston-Saffell: Nearly level to sloping soils that have sandy clay to sandy clay loam subsoil, on ridge tops and slopes.

INDEX TO MAP SHEETS

BRADLEY COUNTY, ARKANSAS



BRADLEY COUNTY, ARKANSAS

SOIL LEGEND

Each soil symbol consists of letters or a combination of letters and numbers. If a soil symbol contains three letters, the third letter shows the class of slope and is given wherever slope forms part of the soil name. Some of the soils that have a symbol consisting of only two letters are nearly level but others have a range of slope. A final number, 2 or 3, shows that the soil is named as eroded or severely eroded.

SYMBOL	NAME
Bb	Bibb silt loam
BgB	Boswell gravelly fine sandy loam, nearly level phase
BgC	Boswell gravelly fine sandy loam, gently sloping phase
BgC2	Boswell gravelly fine sandy loam, eroded gently sloping phase
BoC3	Boswell sandy clay, severely eroded gently sloping phase
BwB	Boswell very fine sandy loam, nearly level phase
BwB2	Boswell very fine sandy loam, eroded nearly level phase
BwC	Boswell very fine sandy loam, gently sloping phase
BwC2	Boswell very fine sandy loam, eroded gently sloping phase
BwE	Boswell very fine sandy loam, 8 to 20 percent slopes
CaB	Cahaba sandy loam, nearly level phase
CaC	Cahaba sandy loam, gently sloping phase
CaC2	Cahaba sandy loam, eroded gently sloping phase
CaD	Cahaba sandy loam, sloping phase
Ch	Chastain silty clay
CT	Caddo and Tickfaw silt loams
Gu	Gullied land
IM	Iuka-Mantachie silt loams
KaB	Kalmia fine sandy loam, nearly level low terrace phase
KaC	Kalmia fine sandy loam, gently sloping low terrace phase
La	Lafe very fine sandy loam
Le	Leaf silt loam
Ma	Mixed alluvial land
Mb	Myatt silt loam
MK	Myatt-Kalmia complex, mound phase
Oc	Ochlockonee fine sandy loam
OfC	Orangeburg fine sandy loam, gently sloping phase
OfC2	Orangeburg fine sandy loam, eroded gently sloping phase
OfD	Orangeburg fine sandy loam, sloping phase
ORE	Orangeburg and Ruston fine sandy loams, moderately steep phases
PLA	Pheba and Lewiston soils, level phases
PLB	Pheba and Lewiston soils, nearly level phases
PLB2	Pheba and Lewiston soils, eroded nearly level phases
PrA	Prentiss very fine sandy loam, level phase
PrB	Prentiss very fine sandy loam, nearly level phase
PrB2	Prentiss very fine sandy loam, eroded nearly level phase
PrC	Prentiss very fine sandy loam, gently sloping phase
PrC2	Prentiss very fine sandy loam, eroded gently sloping phase
PrD	Prentiss very fine sandy loam, sloping phase
Ps	Prentiss very fine sandy loam, mound phase
Ps2	Prentiss very fine sandy loam, eroded mound phase
RuB	Ruston fine sandy loam, nearly level phase
RuC	Ruston fine sandy loam, gently sloping phase
RuC2	Ruston fine sandy loam, eroded gently sloping phase
RuD	Ruston fine sandy loam, sloping phase
RyC3	Ruston sandy clay loam, severely eroded gently sloping phase
SaC	Saffell gravelly fine sandy loam, gently sloping phase
SaC2	Saffell gravelly fine sandy loam, eroded gently sloping phase
SaC3	Saffell gravelly fine sandy loam, severely eroded gently sloping phase
SaD	Saffell gravelly fine sandy loam, sloping phase
SaD2	Saffell gravelly fine sandy loam, eroded sloping phase
SaE	Saffell gravelly fine sandy loam, 12 to 25 percent slopes
SdA	Savannah very fine sandy loam, level phase
SdB	Savannah very fine sandy loam, nearly level phase
SdB2	Savannah very fine sandy loam, eroded nearly level phase
SdC	Savannah very fine sandy loam, gently sloping phase
SdC2	Savannah very fine sandy loam, eroded gently sloping phase
SdD	Savannah very fine sandy loam, sloping phase
SfA	Sawyer very fine sandy loam, level phase
SfB	Sawyer very fine sandy loam, nearly level phase
SfB2	Sawyer very fine sandy loam, eroded nearly level phase
SfC	Sawyer very fine sandy loam, gently sloping phase
SfC2	Sawyer very fine sandy loam, eroded gently sloping phase
SfE	Sawyer very fine sandy loam, moderately steep phase
ShB2	Shubuta fine sandy loam, eroded nearly level phase
ShC2	Shubuta fine sandy loam, eroded gently sloping phase
ShE	Shubuta gravelly fine sandy loam, moderately steep phase
SK	Stough-Kalmia complex, mound phase
StA	Stough very fine sandy loam, level phase
StB	Stough very fine sandy loam, nearly level phase
WcA	Wilcox silty clay loam, level phase
WcB	Wilcox silty clay loam, nearly level phase
WcC	Wilcox silty clay loam, gently sloping phase
WcC2	Wilcox silty clay loam, eroded gently sloping phase
WcE	Wilcox silty clay loam, moderately steep phase
WcF	Wilcox silty clay loam, steep phase

Soil map constructed 1960 by Cartographic Division, Soil Conservation Service, USDA, from 1951 aerial photographs. Controlled mosaic based on Arkansas plane coordinate system, south zone, Lambert conformal conic projection, 1927 North American datum.

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Roads
- Good motor
- Poor motor
- Trail
- Marker, U. S., State

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferry
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings
- School
- Church
- Station

Mine and Quarry
- Shaft
- Dump
- Prospect

Pits, gravel or other

Power line

Pipeline

Cemetery

Dam

Levee

Tank

Sawmill

Forest fire or lookout station

Canal lock (point upstream)

BOUNDARIES

- National or state
- County
- Township, U. S.
- Section line, corner
- Reservation
- Land grant

DRAINAGE

Streams
- Perennial
- Intermittent, unclass.

Canals and ditches

Lakes and ponds
- Perennial
- Intermittent

Wells

Springs

Marsh

Wet spot

RELIEF

Escarpments
- Bedrock
- Other

Prominent peaks

Depressions (Large, Small)
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

Soil type outline and symbol

Gravel

Stones

Rock outcrops

Chert fragments

Clay spot

Sand spot

Indian mound

Made land

Erosion
- Wind, moderate
- Wind, severe
- Blowout
- Wind hummock
- Overblown soil

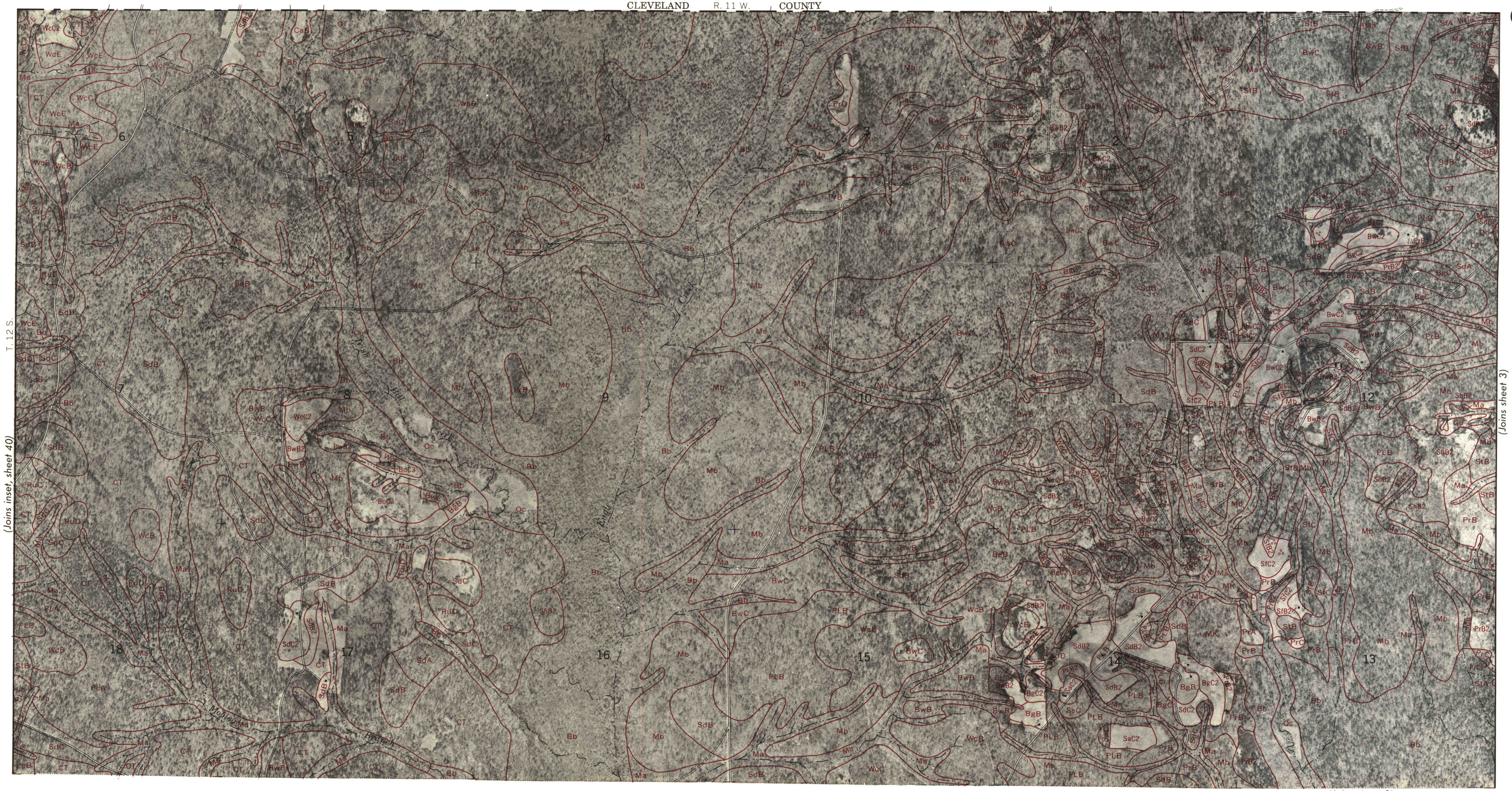
Gullies

1

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

Range, township, and section corners shown on this map are indefinite.

(Joins inset, sheet 40)



(Joins sheet 3)

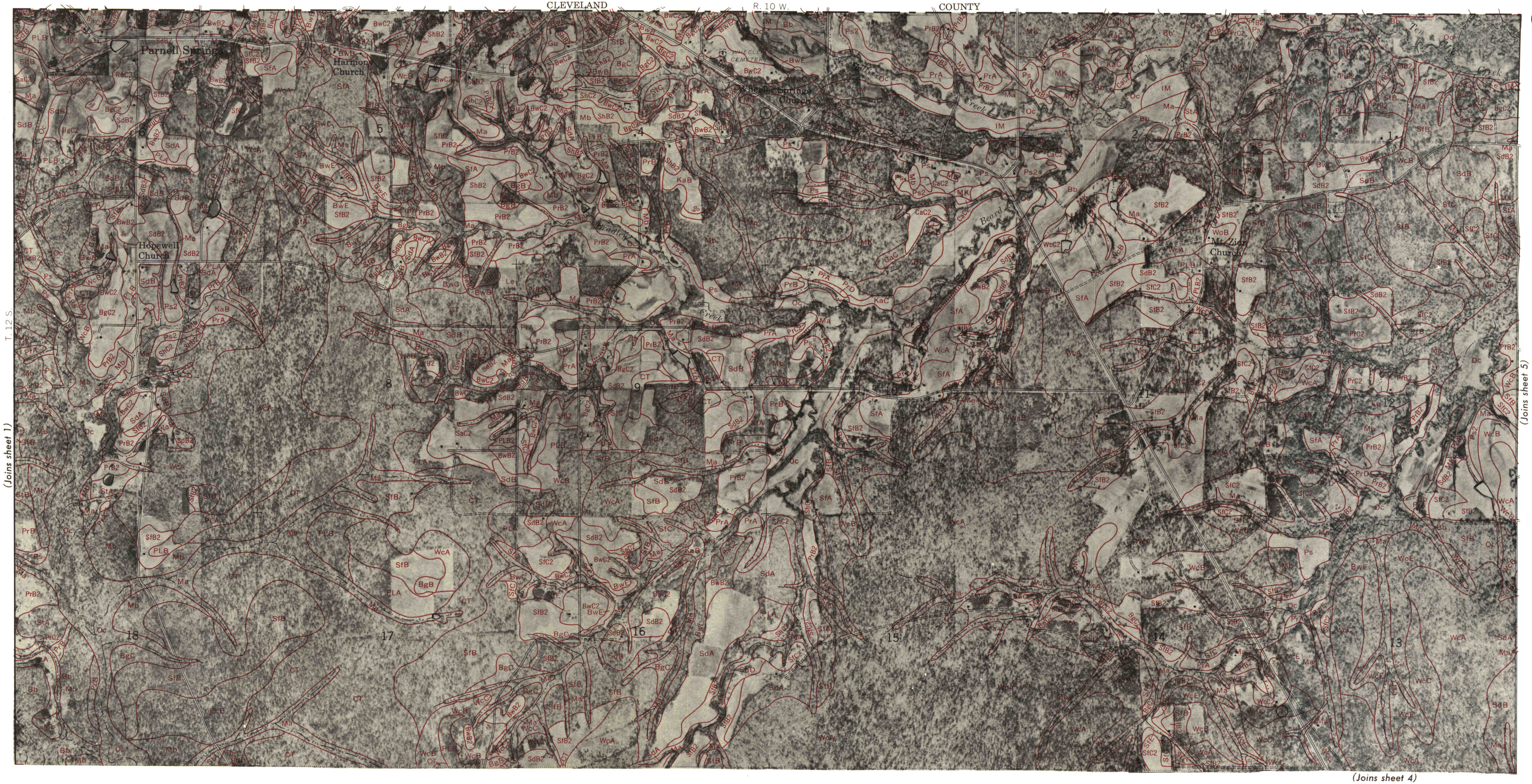
(Joins sheet 2)

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

2

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

CLEVELAND R. 10 W. COUNTY



(Joins sheet 1)

(Joins sheet 5)

(Joins sheet 4)

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

Range, township, and section corners shown on this map are indefinite.

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

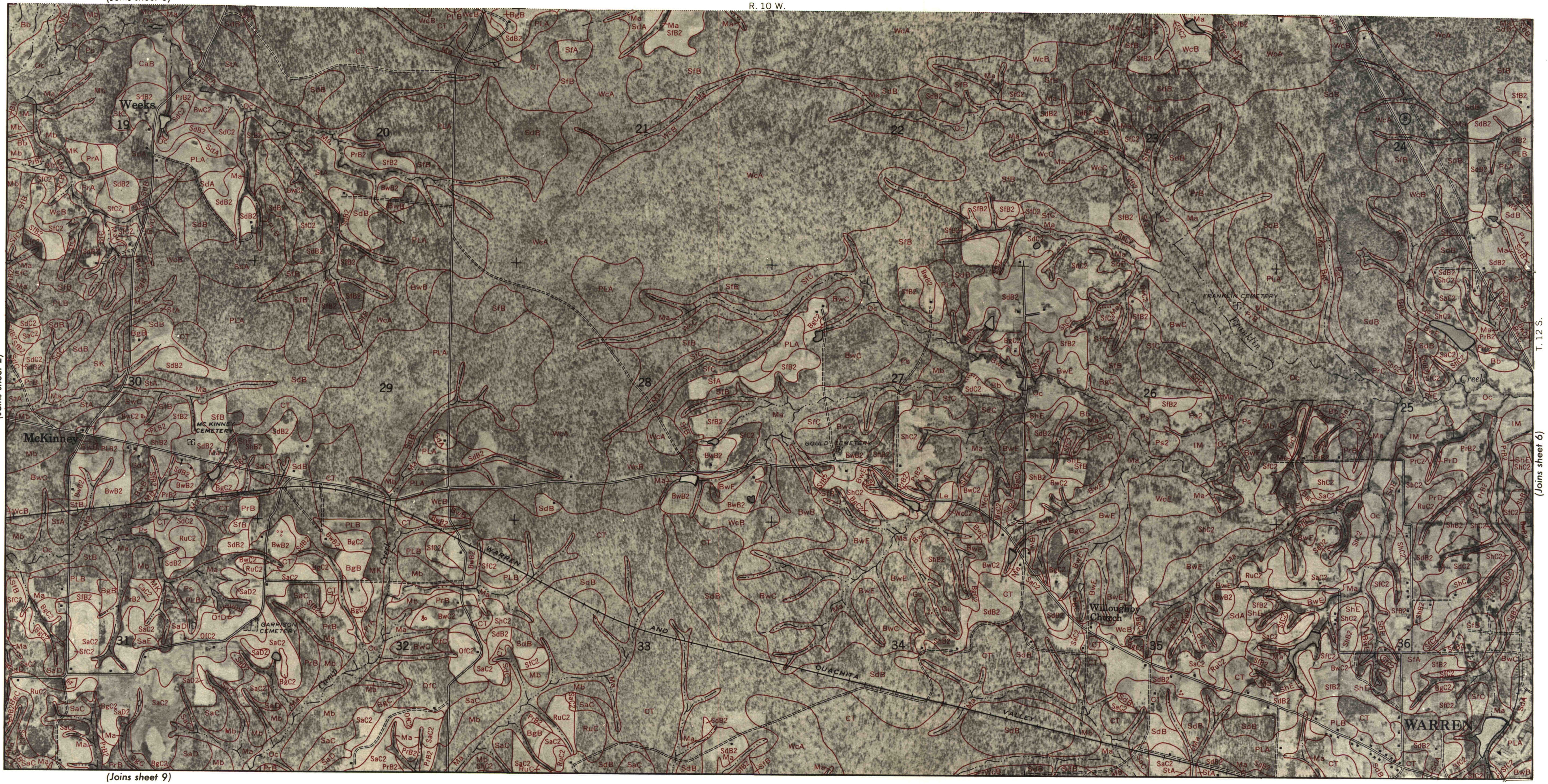
4

(Joins sheet 3)

R. 10 W.

N

(Joins sheet 2)



T. 12 S.

(Joins sheet 6)

(Joins sheet 9)

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

5

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

Range, township, and section corners shown on this map are indefinite.

0 1/2 1 Mile Scale 1:20000 0 5000 Feet


6
(Joins sheet 5)
(Joins sheet 4)
(Joins sheet 11)
N
R. 9 W.
T. 12 S.
DREW COUNTY
Harmony
WARREN
Walnut Creek
Franklin Creek
SALINE RIVER
MISSOURI PACIFIC
TRANSMISSION LINE
POWER
0 1/2 1 Mile
Scale 1:20000
0 5000 Feet

7

R. 11 W.

(Joins sheet 2)

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

Range, township, and section corners shown on this map are indefinite.

T. 13 S.

(Joins inset, sheet 41)

(Joins sheet 9)

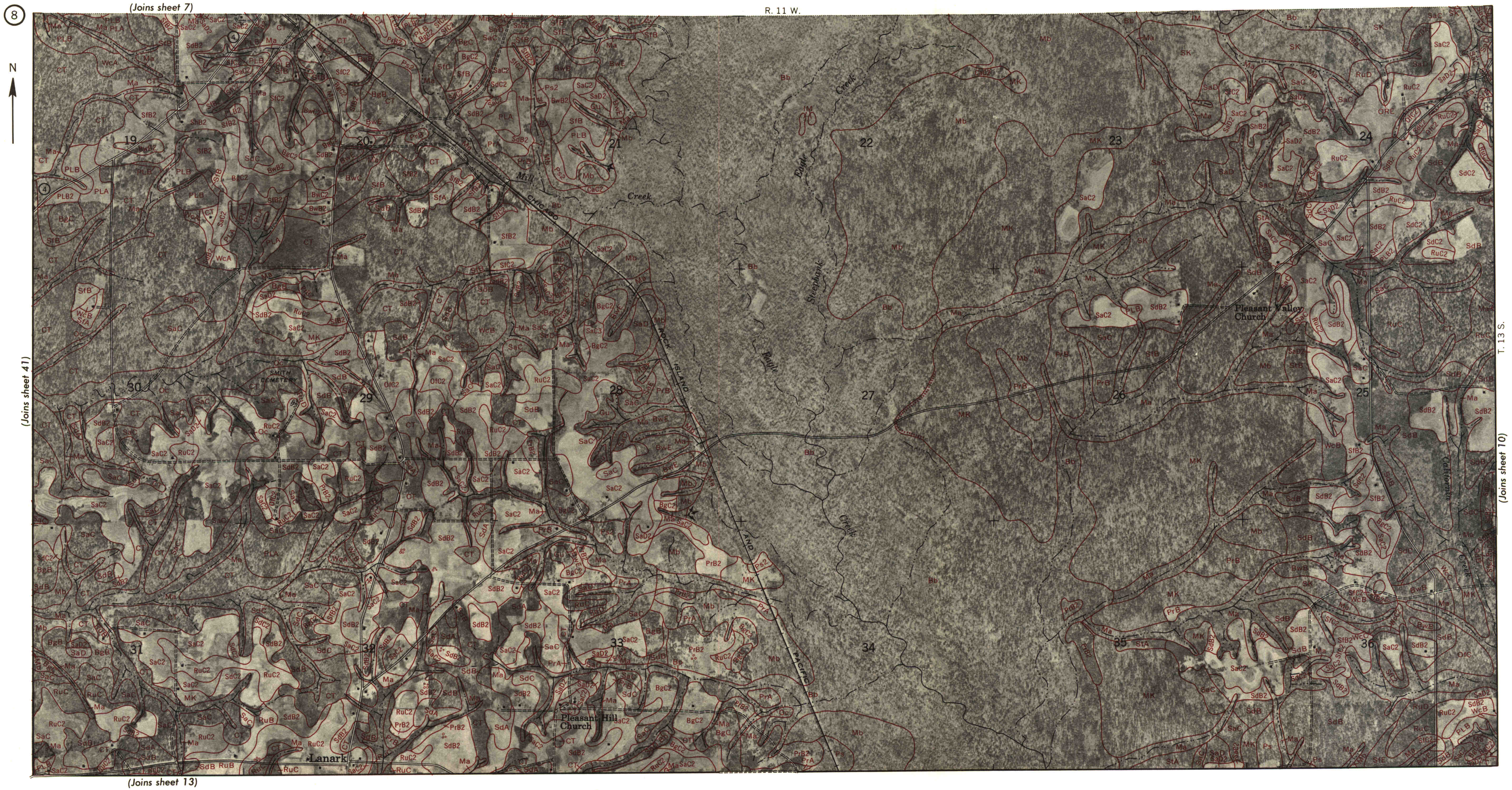
(Joins sheet 8)

N

0 1/2 1 Mile

Scale 1:20000

0 5000 Feet



0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

9

R. 10 W.

(Joins sheet 4)

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

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T. 13 S.

(Joins sheet 7)

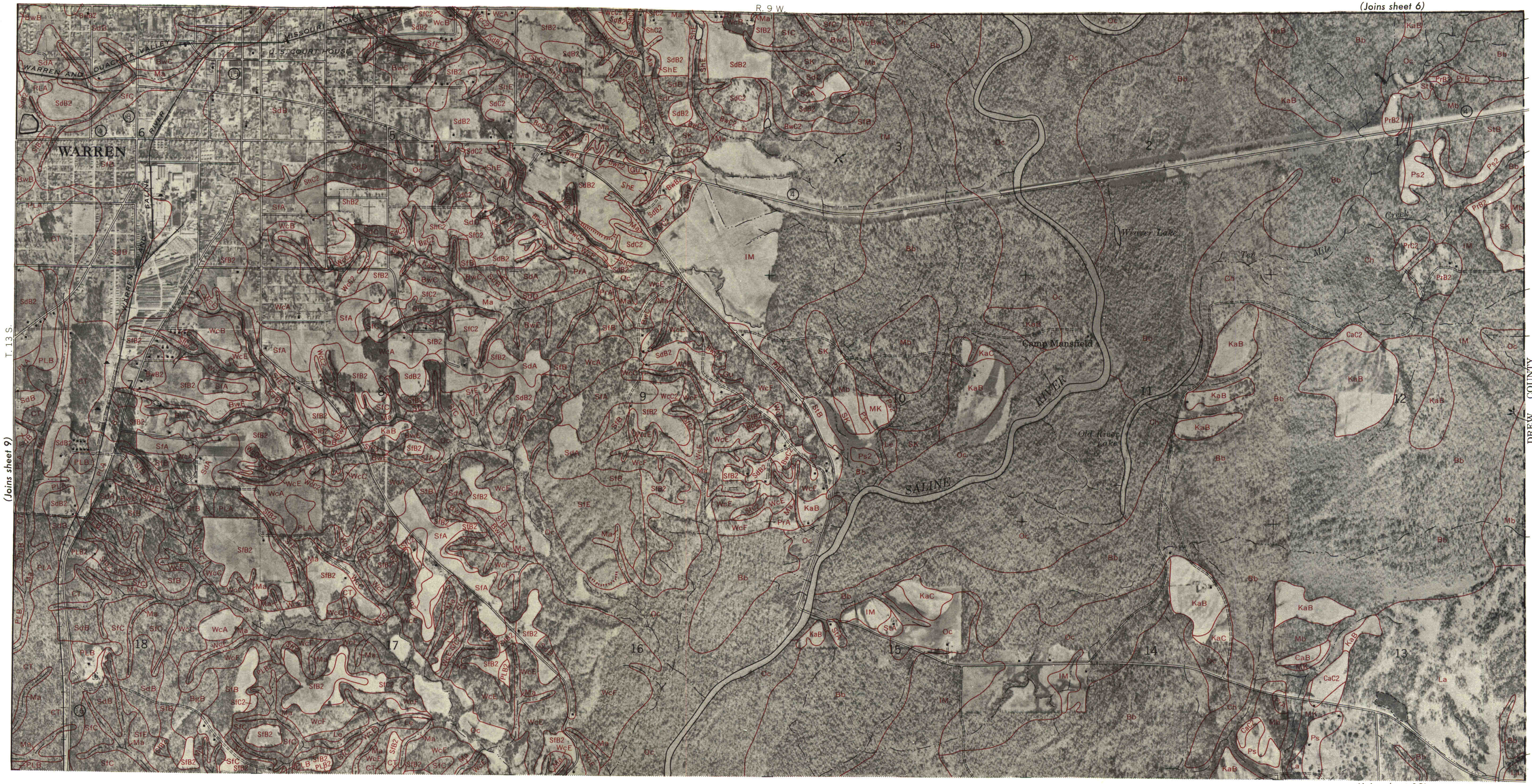
(Joins sheet 11)

(Joins sheet 10)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet


10
(Joins sheet 9)
R. 10 W.
N
(Joins sheet 8)
(Joins sheet 12)
T. 13 S.
(Joins sheet 15)
15
Farmville
19
20
21
22
23
24
30
29
28
27
26
25
31
32
33
34
35
36
0
1/2
1 Mile
Scale 1:20 000
0
5000 Feet

(Joins sheet 6)



(Joins sheet 9)

(Joins sheet 12)

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

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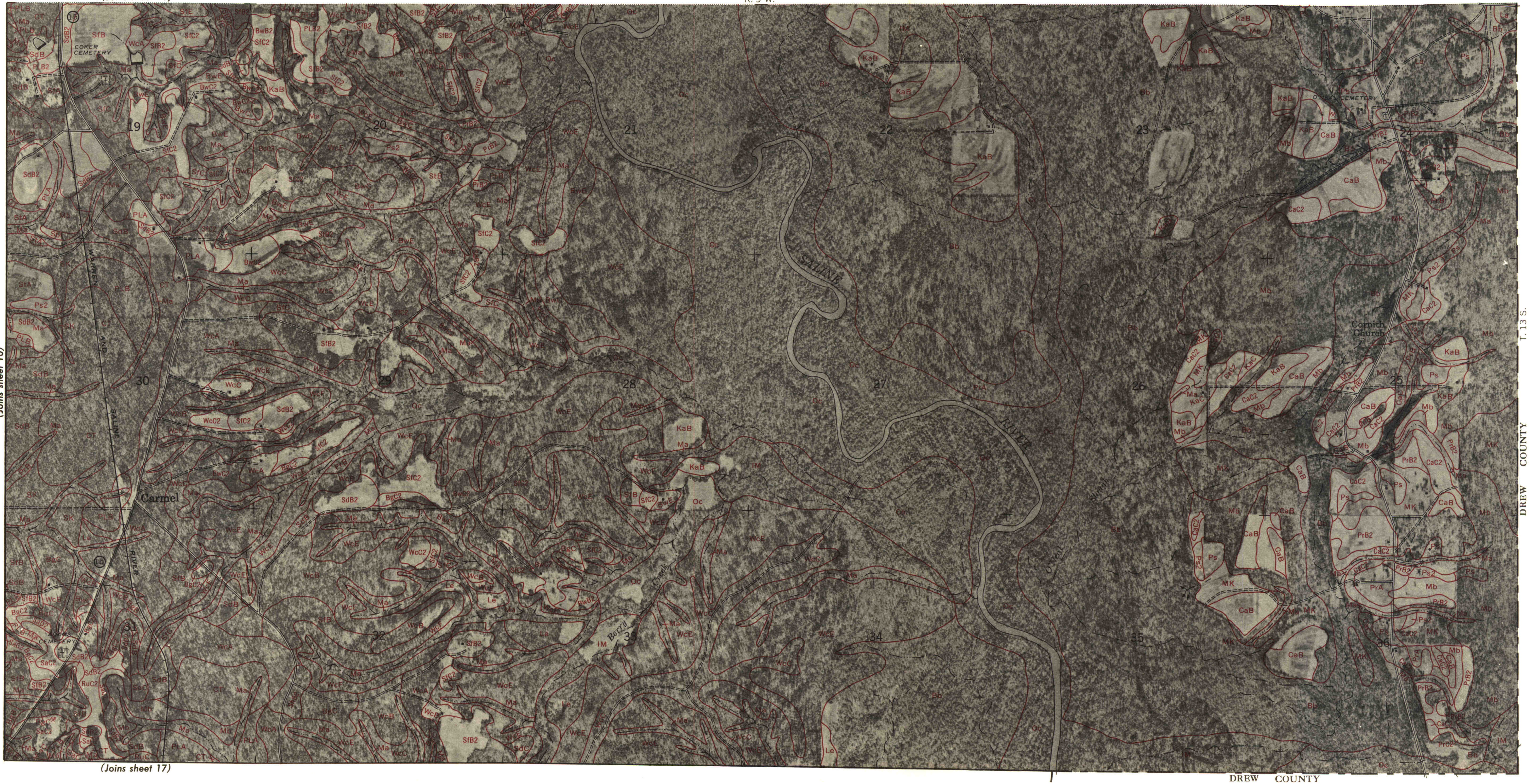
0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

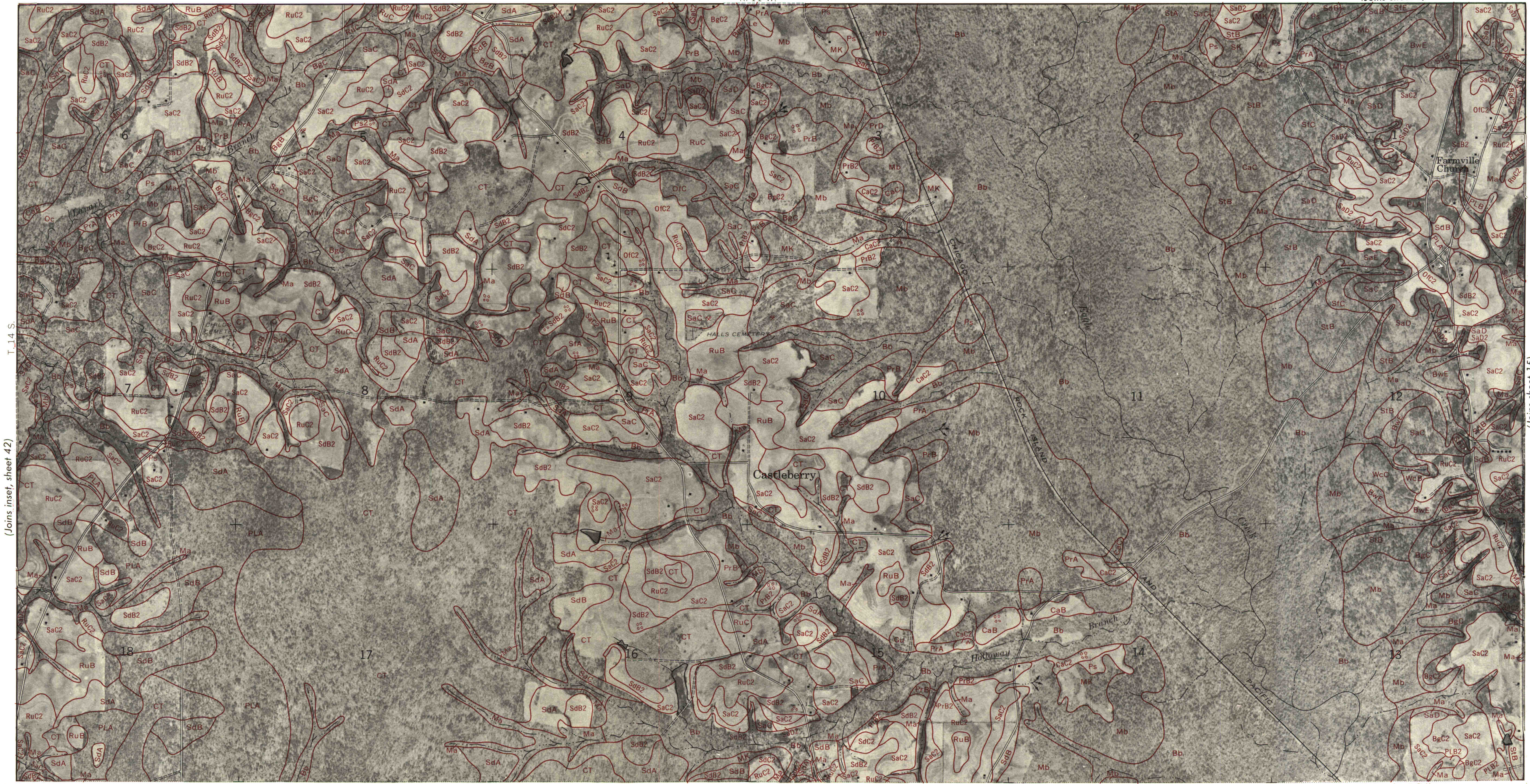
12



0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 8)

13



(Joins inset, sheet 42)

(Joins sheet 15)

(Joins sheet 14)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

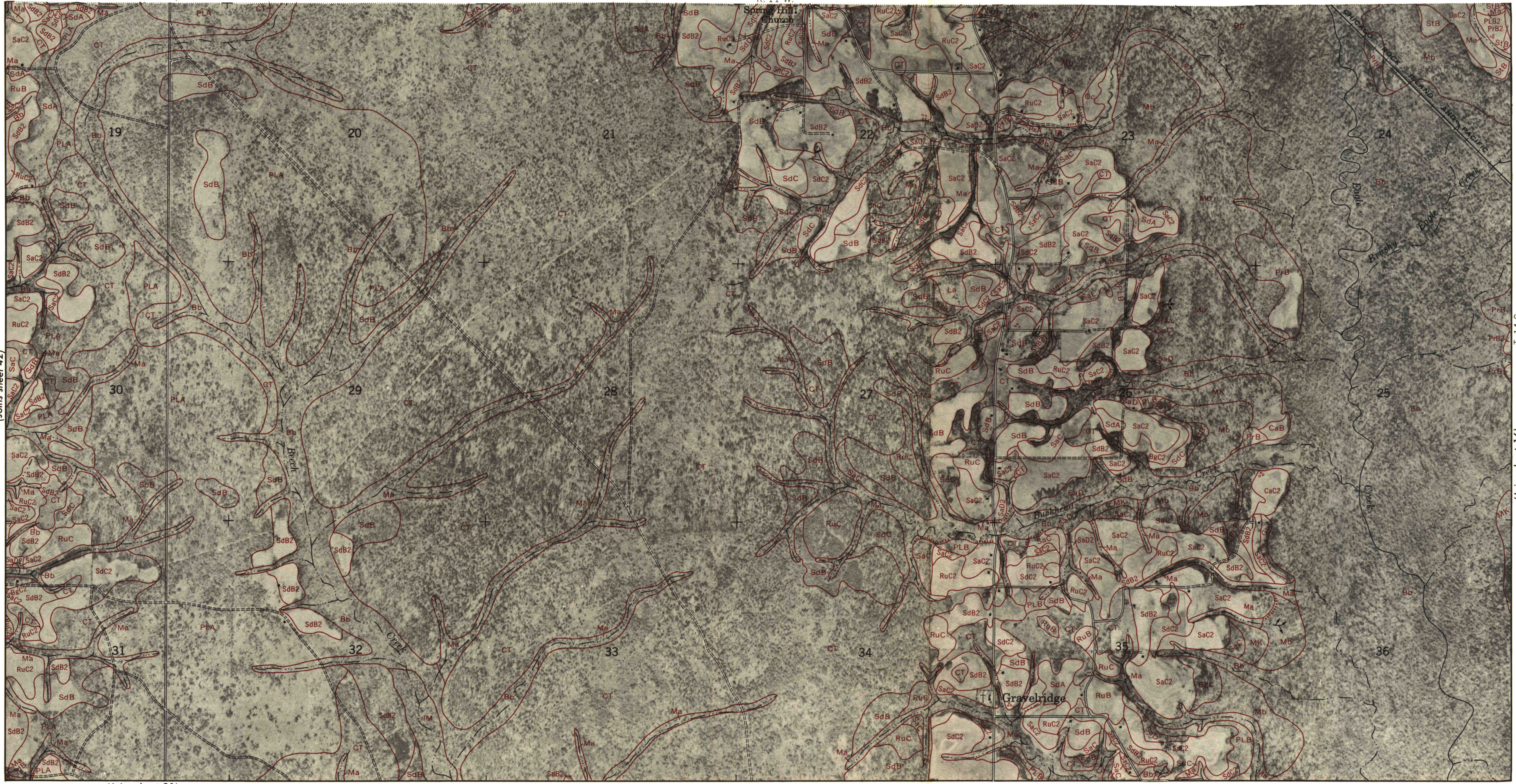
This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

Range, township, and section corners shown on this map are indefinite.

14

(Joins sheet 13)

(Joins sheet 42)



(Joins sheet 16)

(Joins sheet 21)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

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0 ½ 1 Mile Scale 1:20000 0 5000 Feet

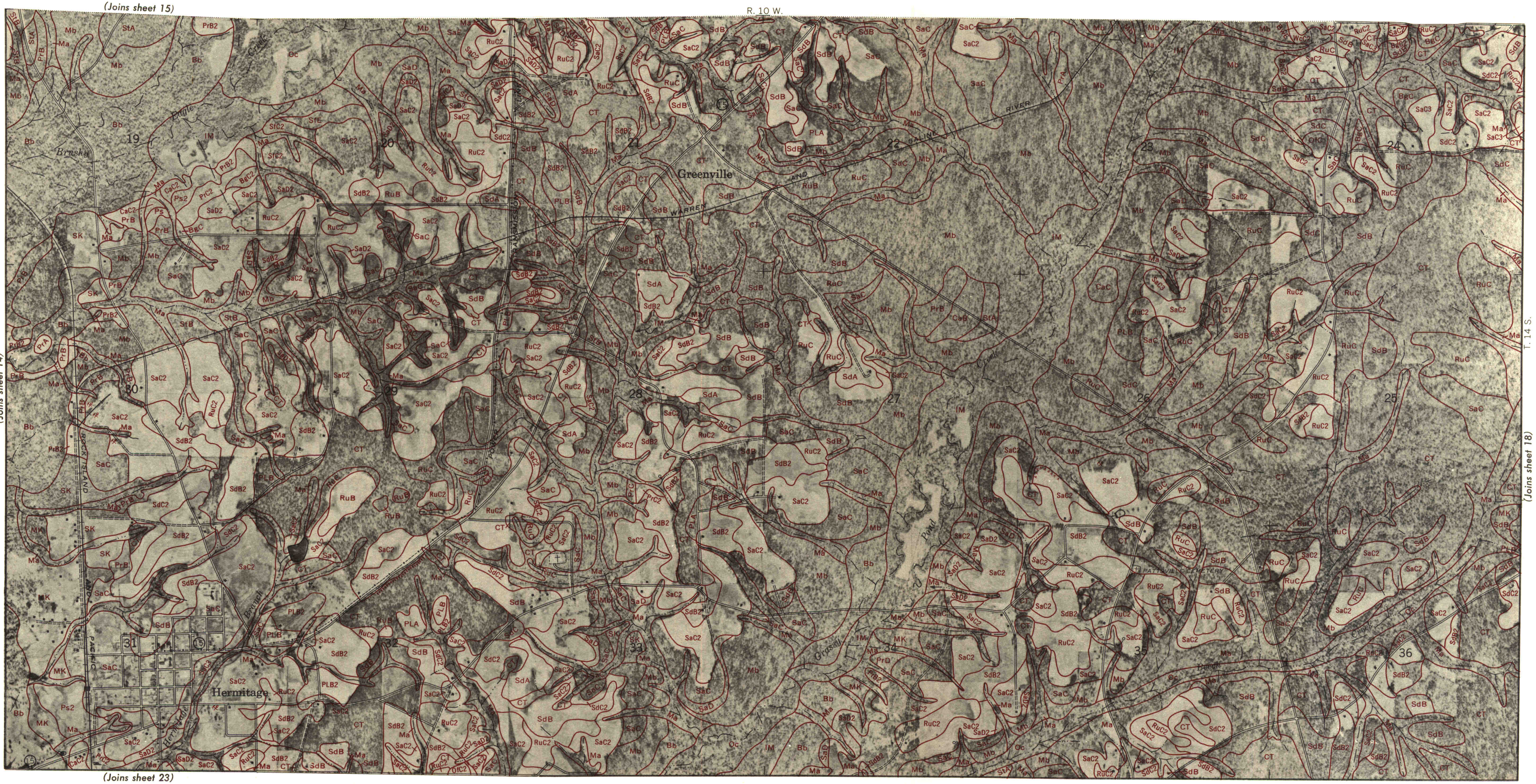
16

(Joins sheet 15)

R. 10 W.

N

(Joins sheet 14)



(Joins sheet 18)

(Joins sheet 23)

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

R. 9 W.

(Joins sheet 12)

17

N

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

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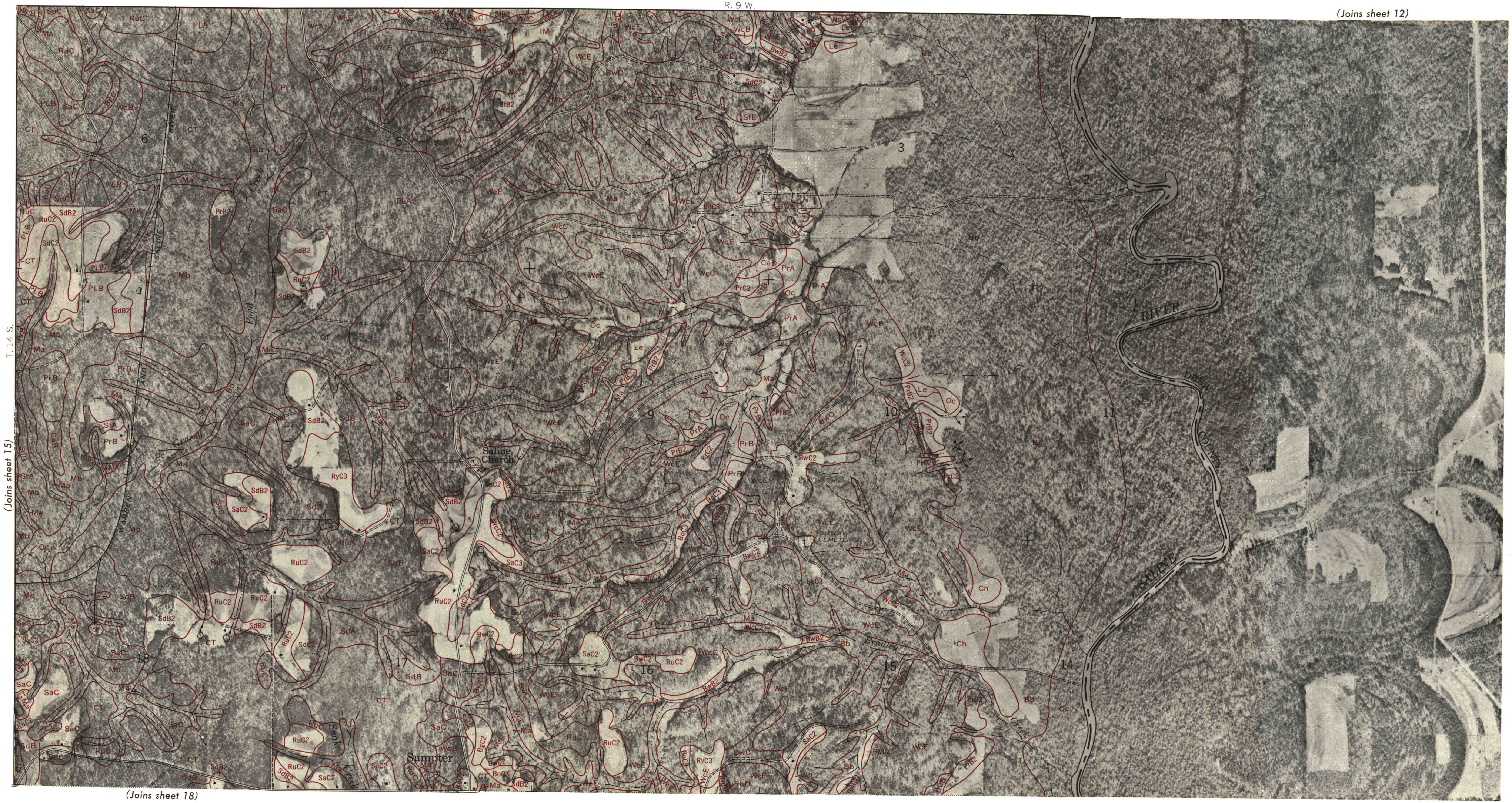
T. 14 S.

(Joins sheet 15)



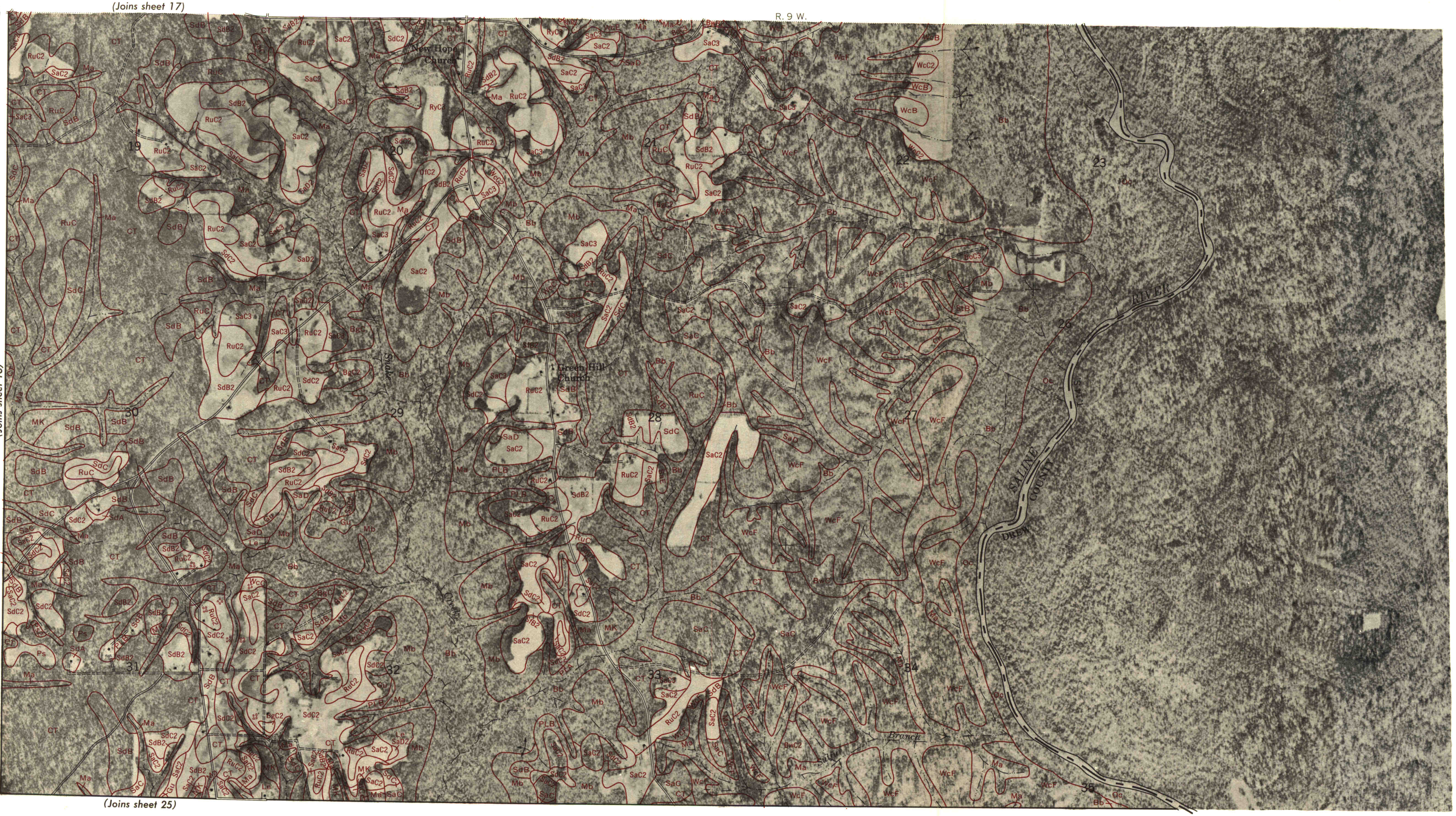
(Joins sheet 18)

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

18

(Joins sheet 17)

(Joins sheet 16)

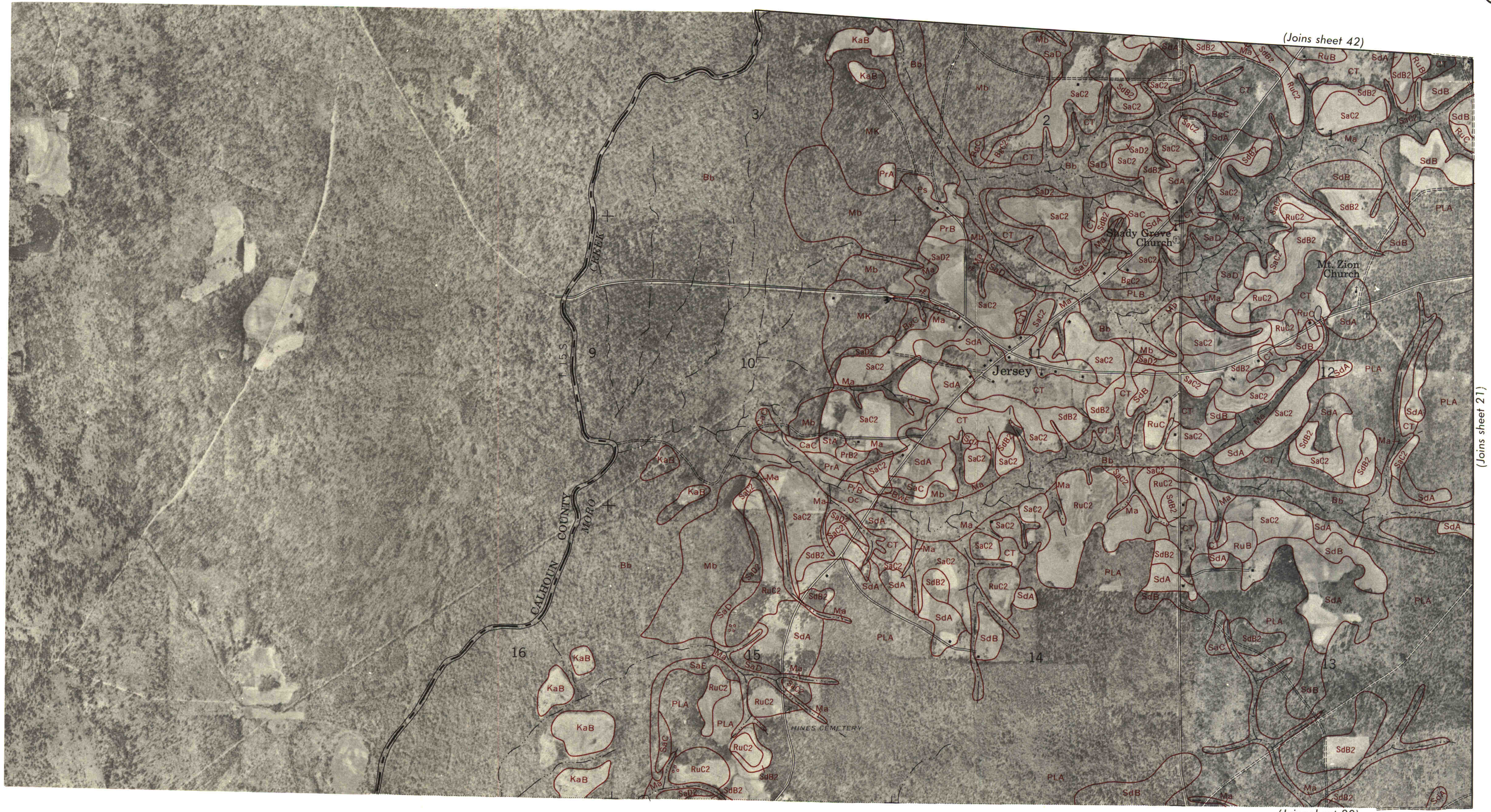


(Joins sheet 25)

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

R. 12 W.

(Joins sheet 42)



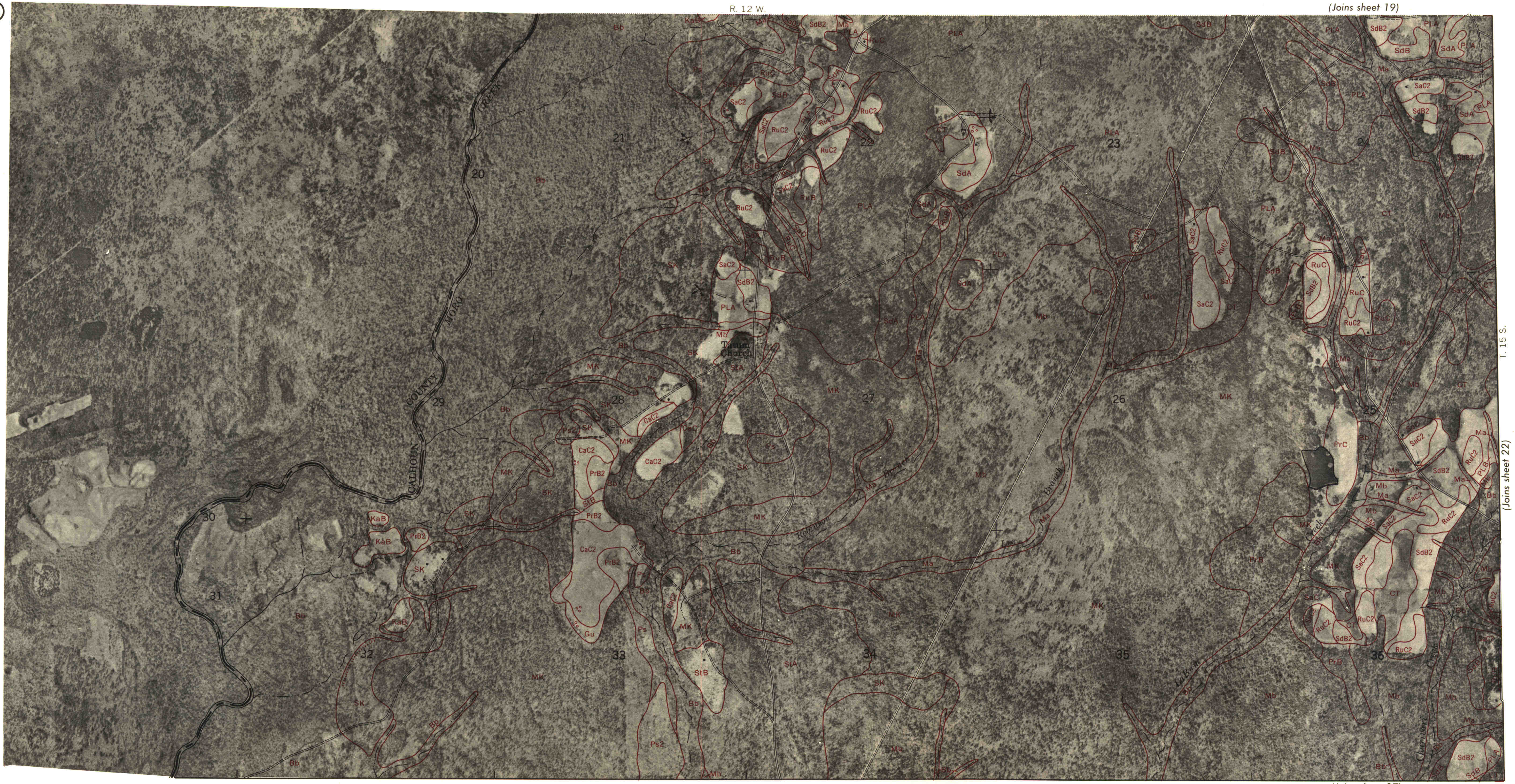
(Joins sheet 21)

(Joins sheet 20)

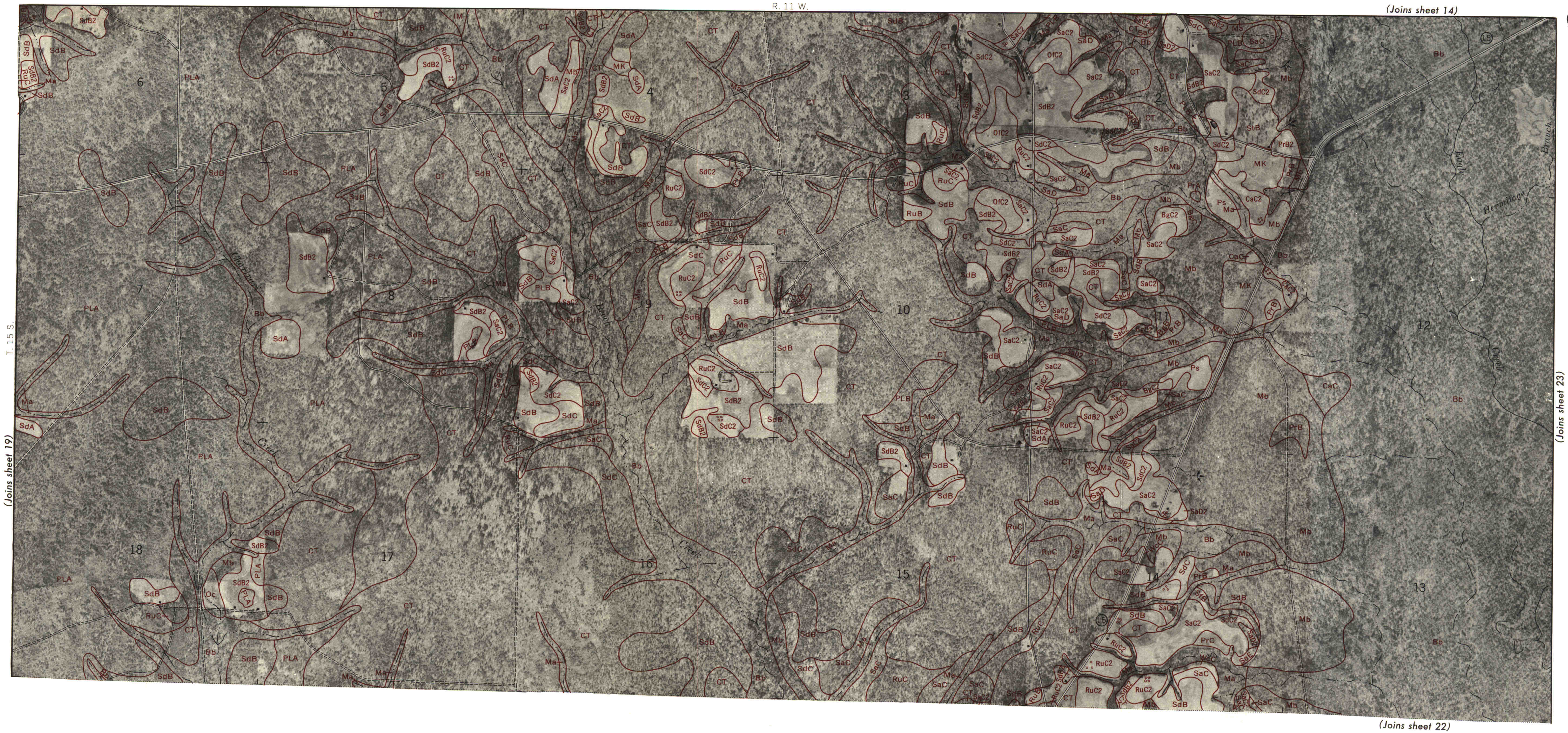
This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

Range, township, and section corners shown on this map are indefinite.

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet



0 1/2 1 Mile Scale 1:20 000 0 5000 Feet



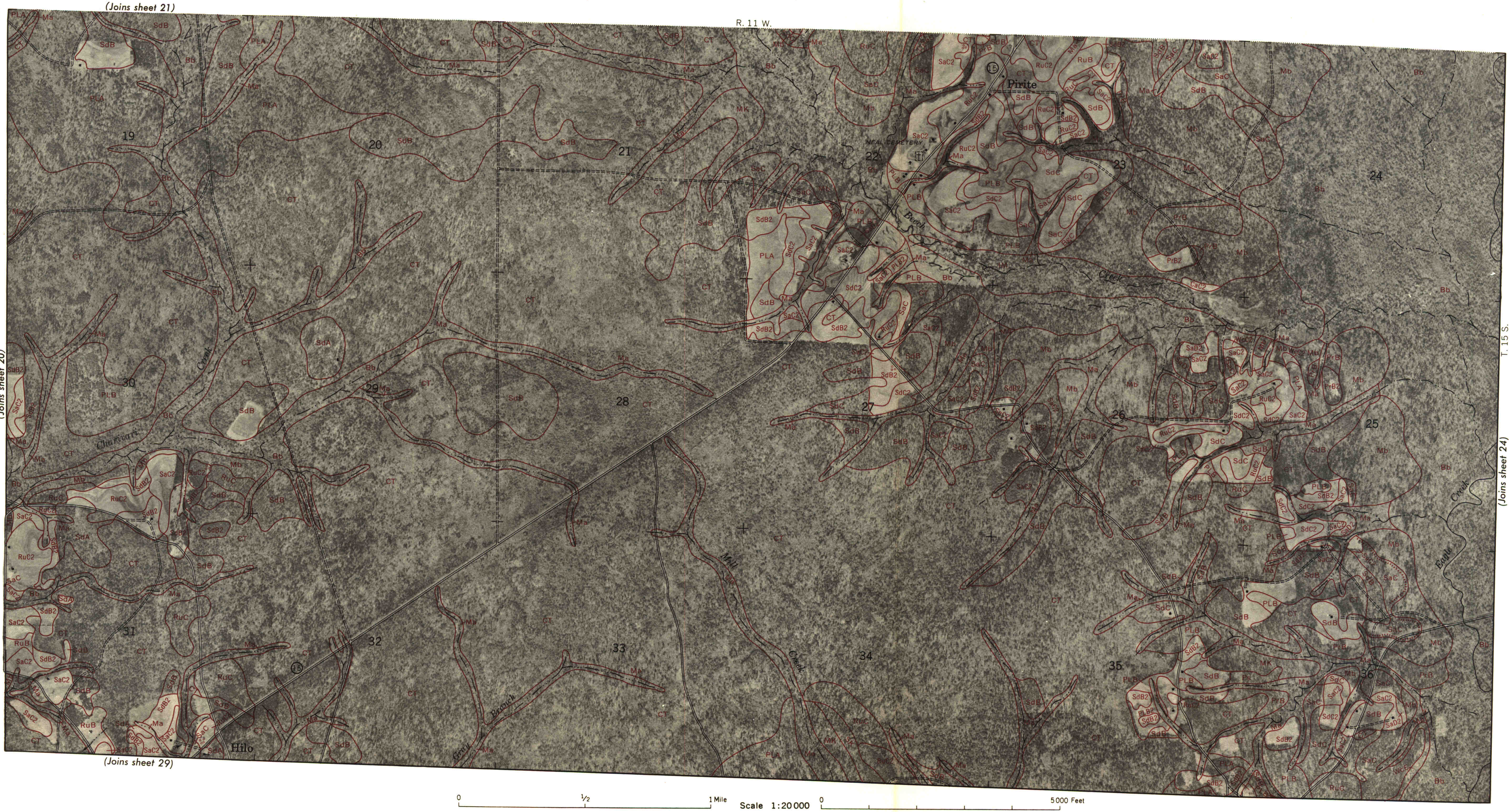
This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

Range, township, and section corners shown on this map are indefinite.

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

BRADLEY COUNTY, ARKANSAS-SHEET NUMBER 22

22



0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

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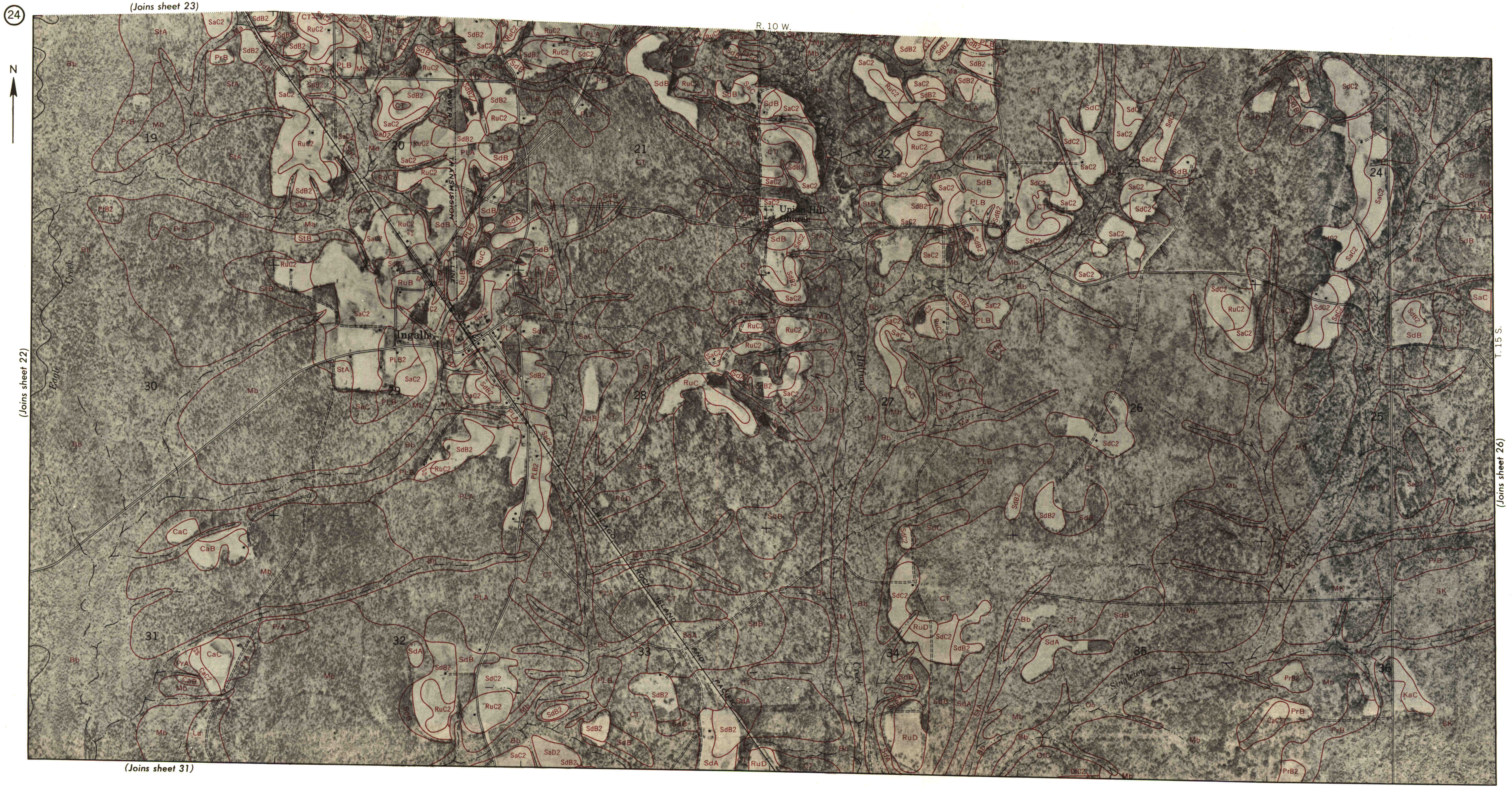
Range, township, and section corners shown on this map are indefinite.

0 ½ 1 Mile Scale 1:20000 0 5000 Feet



0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

25

N

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

mation regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

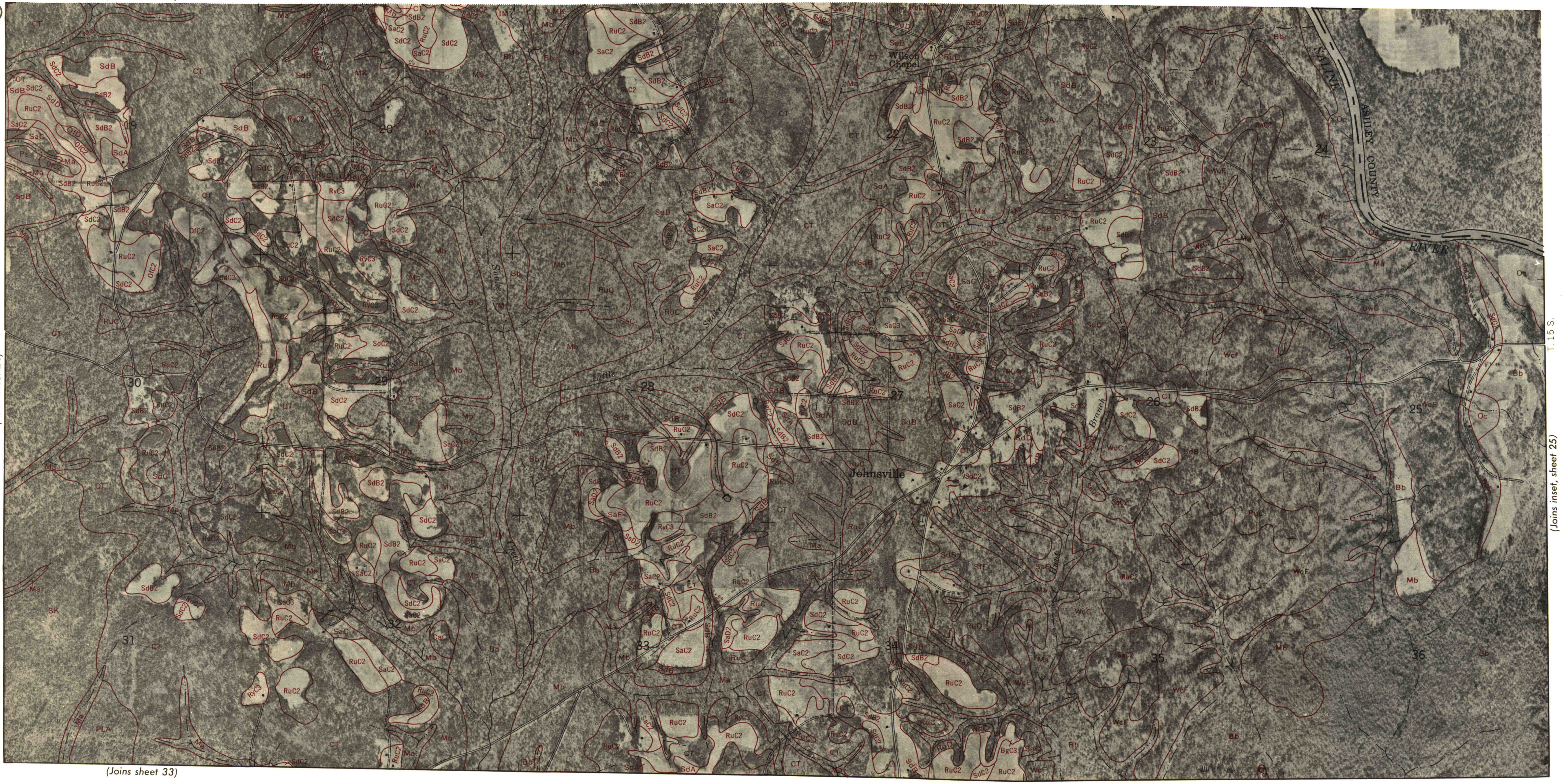
Range, township, and section corners shown on this map are indefinite.

26

(Joins sheet 25)

R. 9 W.

(Joins sheet 24)



T. 15 S.

(Joins inset, sheet 25)

(Joins sheet 33)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

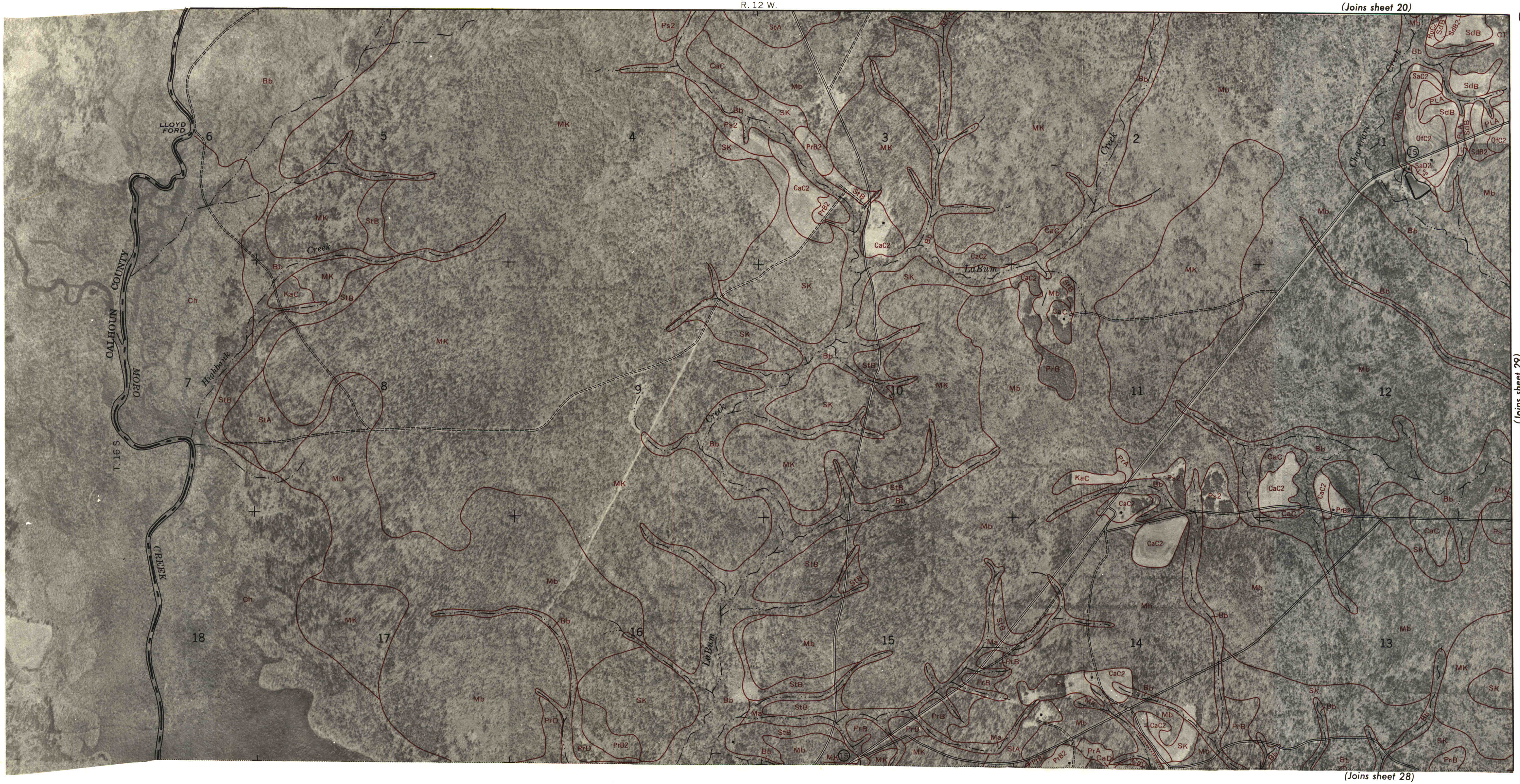
R. 12 W.

(Joins sheet 20)

27

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

Range, township, and section corners shown on this map are indefinite.

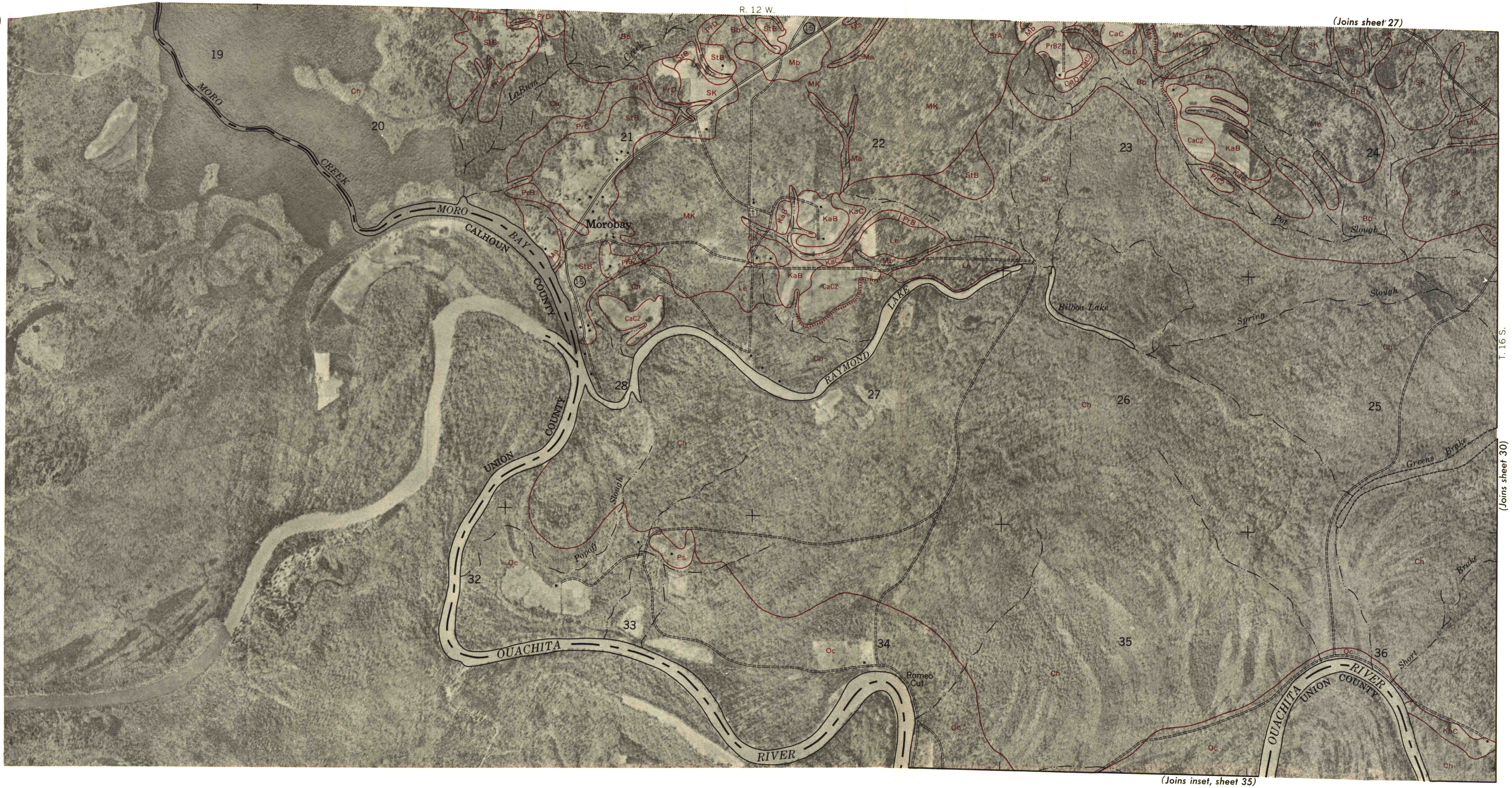


(Joins sheet 29)

(Joins sheet 28)

0 1/2 1 Mile Scale 1:20000 0 5000 Feet

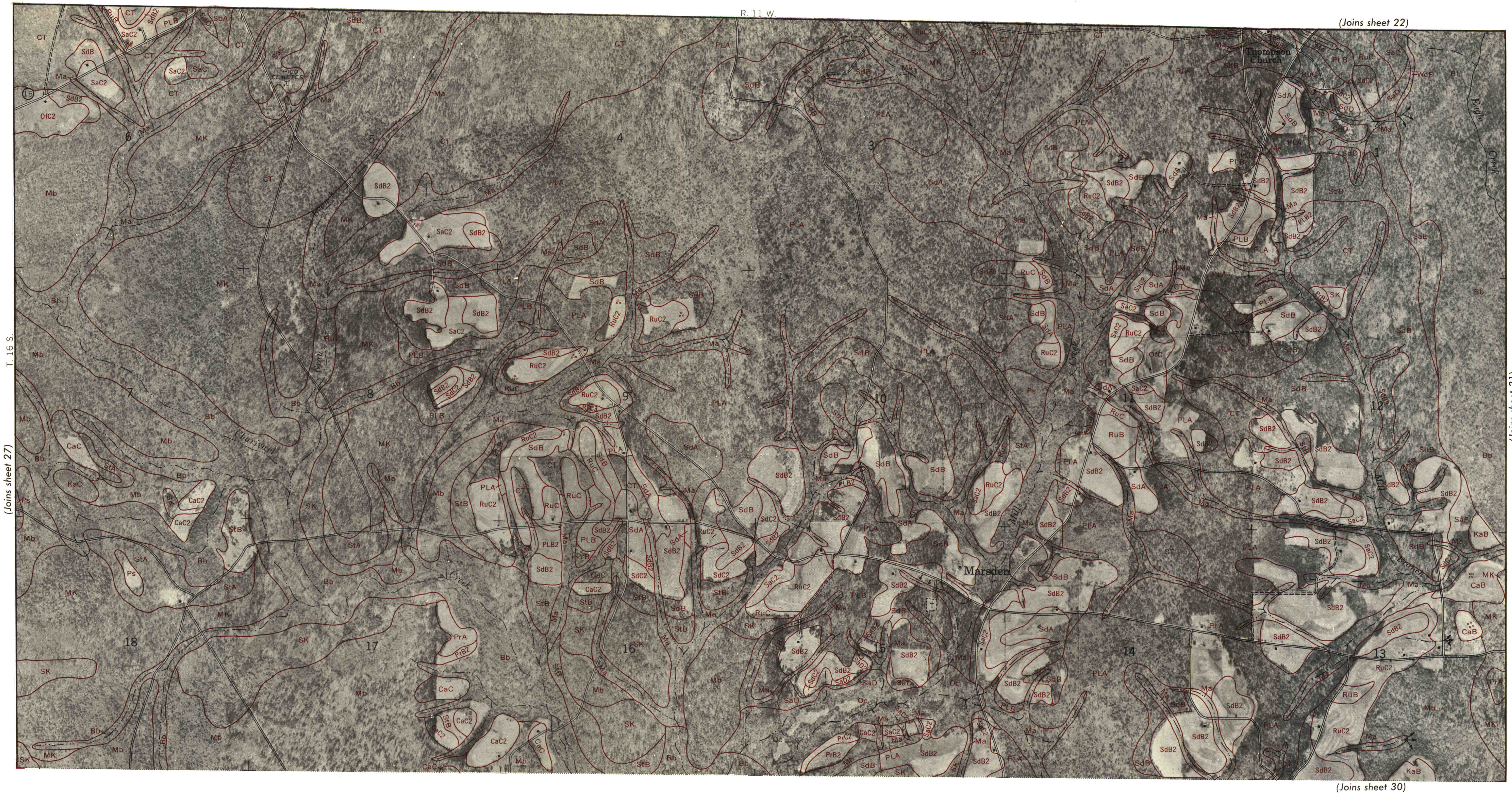
(28)



0 ½ 1 Mile Scale 1:20000 0 5000 Feet

(Joins sheet 22)

29



(Joins sheet 27)

(Joins sheet 31)

(Joins sheet 30)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

mation regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

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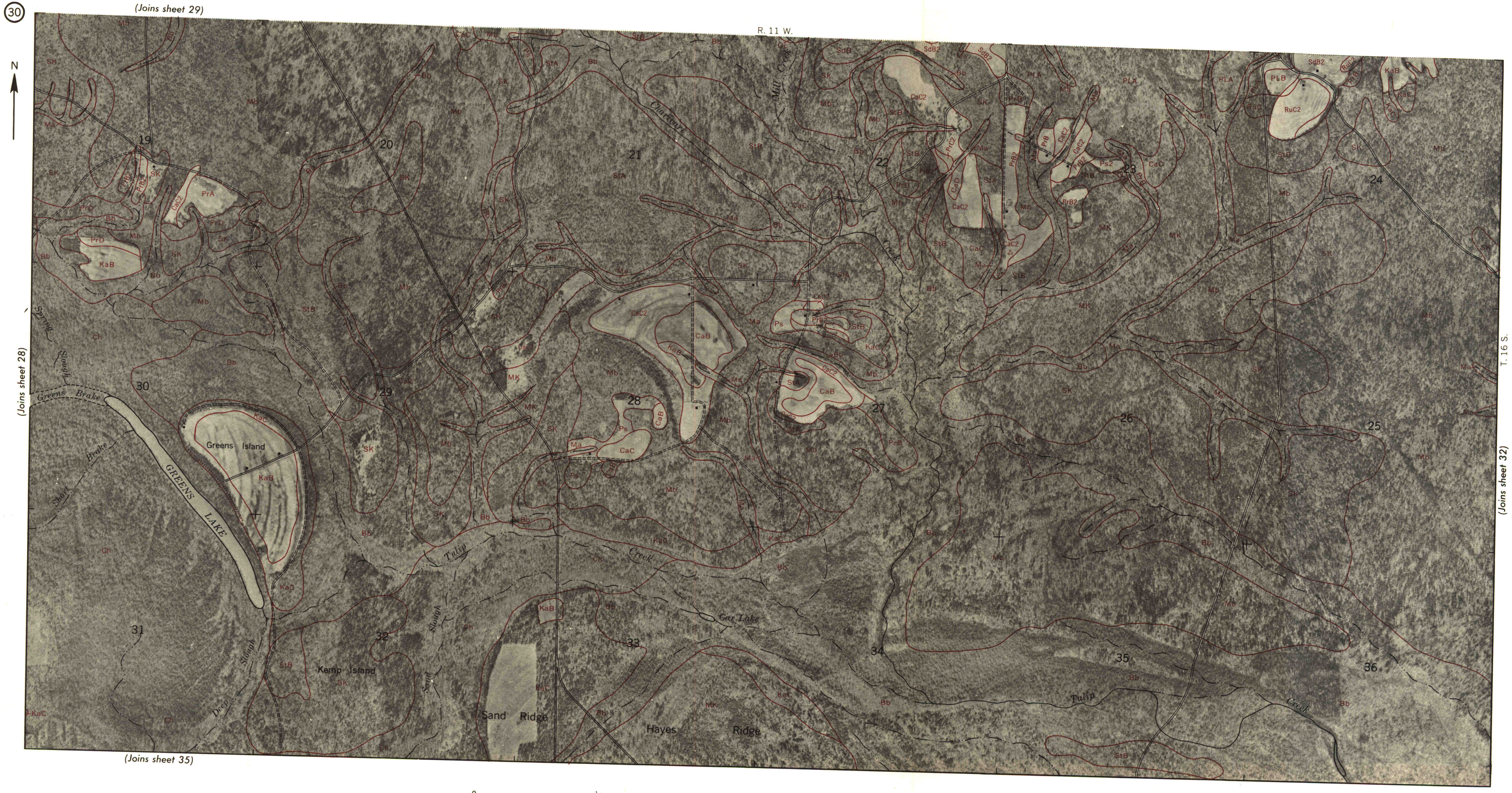
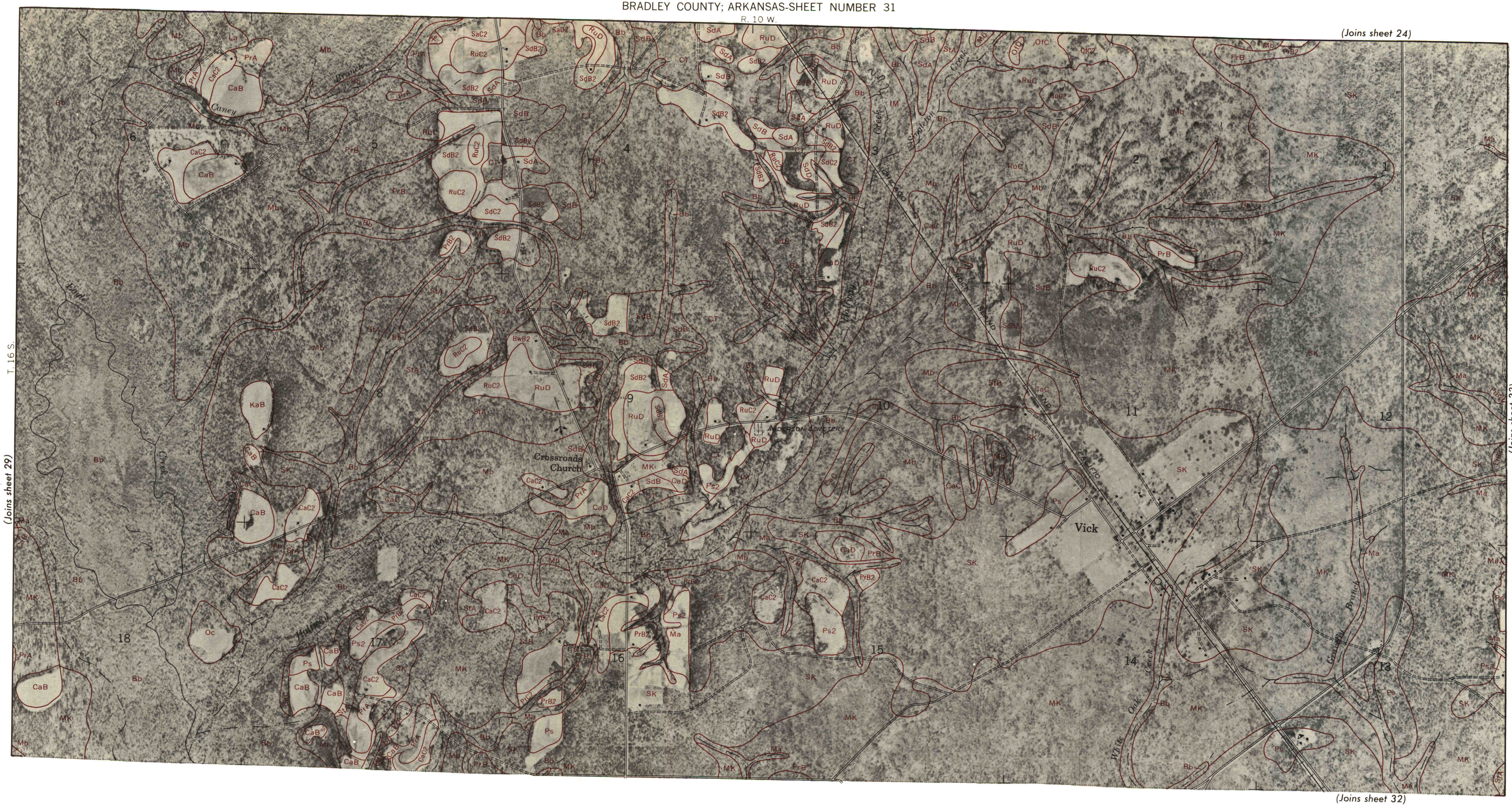


0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

R. 10 W.

(Joins sheet 24)



(Joins sheet 29)

(Joins sheet 33)

(Joins sheet 32)

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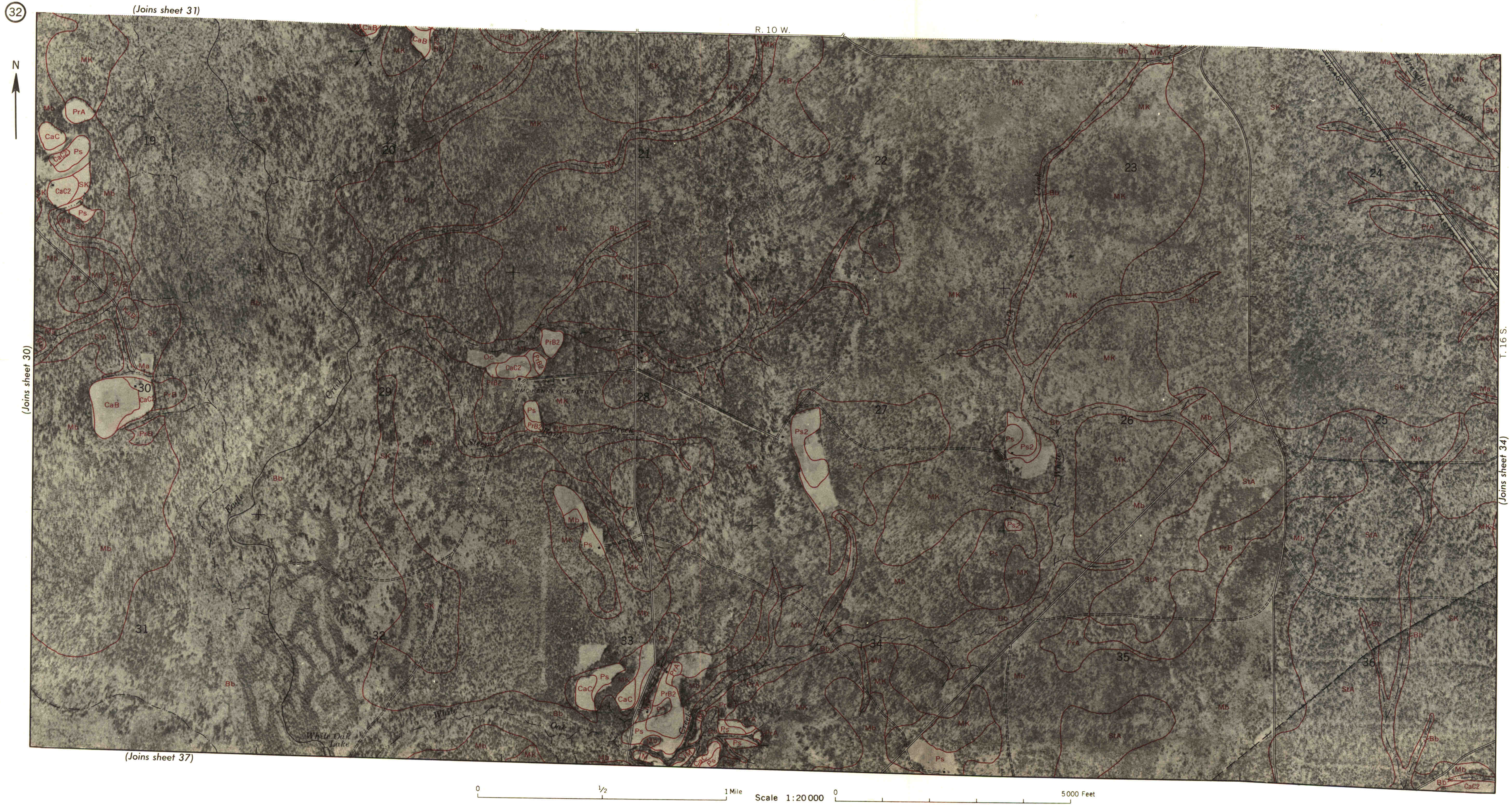
0 | 1/2 | 1 Mile

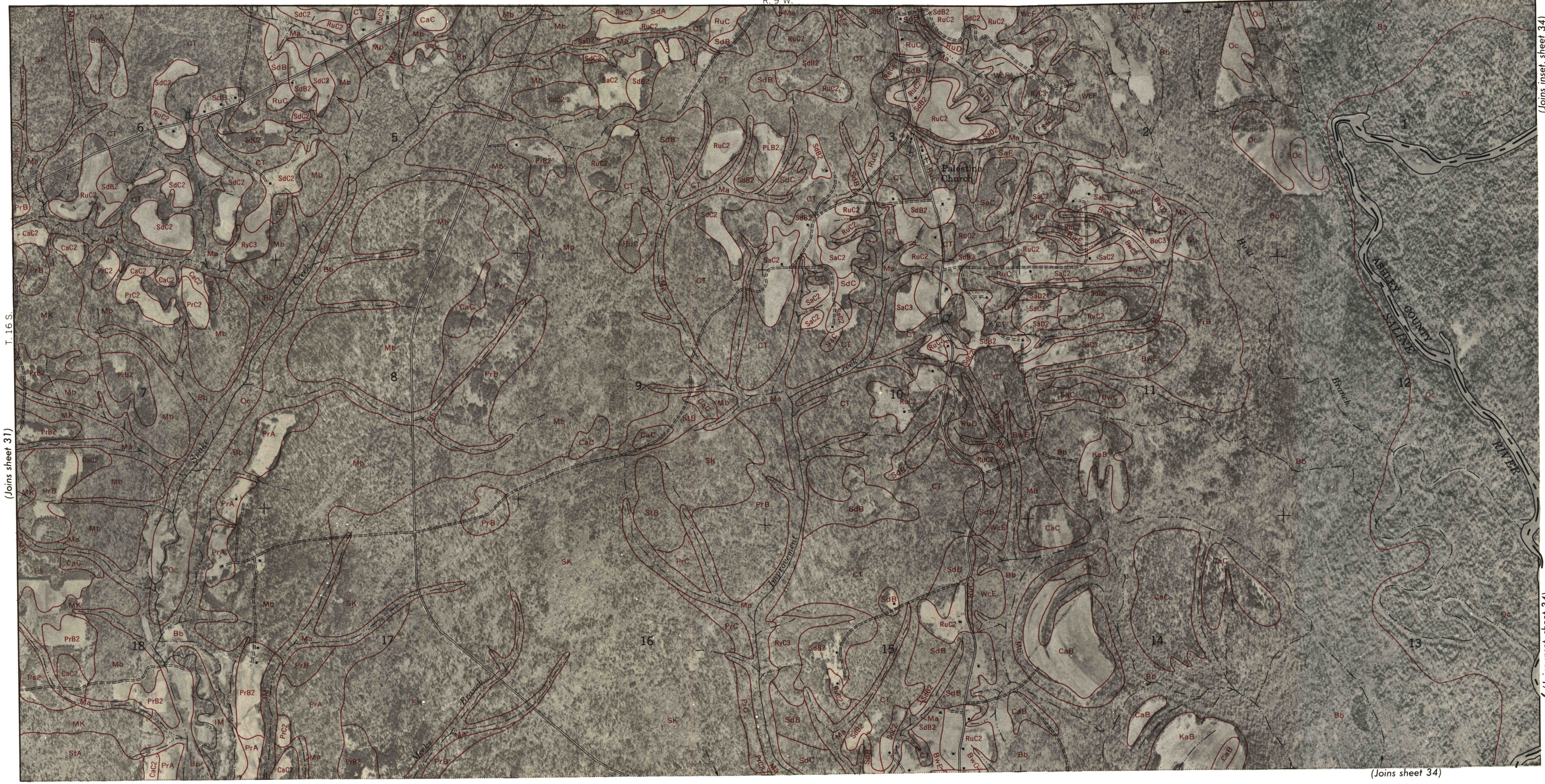
Scale 1:20000

0 | 5000 Feet


32
(Joins sheet 31)
N
R. 10 W.
T. 16 S.
(Joins sheet 30)
(Joins sheet 34)
(Joins sheet 37)
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
White Oak Lake
0
1/2
1 Mile
Scale 1:20000
0
5000 Feet

(Joins sheet 26)

33



(Joins inset, sheet 34)

(Joins sheet 31)

(Joins sheet 34)

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0 ½ 1 Mile Scale 1:20000 0 5000 Feet

34

0 ½ 1 Mile
Scale 1:20 000
0 5000 Feet

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0 1/2 1 Mile Scale 1:20000 0 5000 Feet

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

R. 10 W.

(37)

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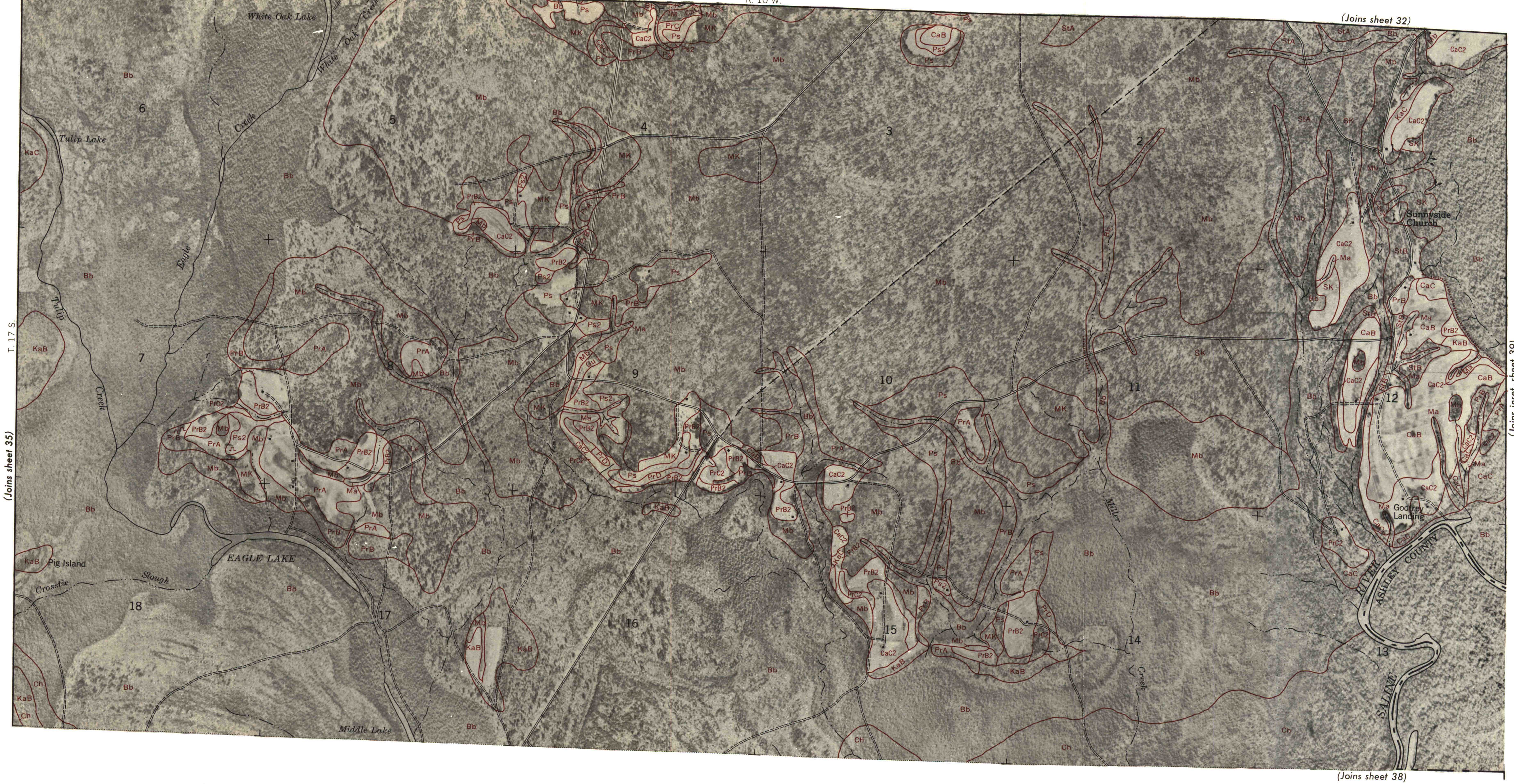
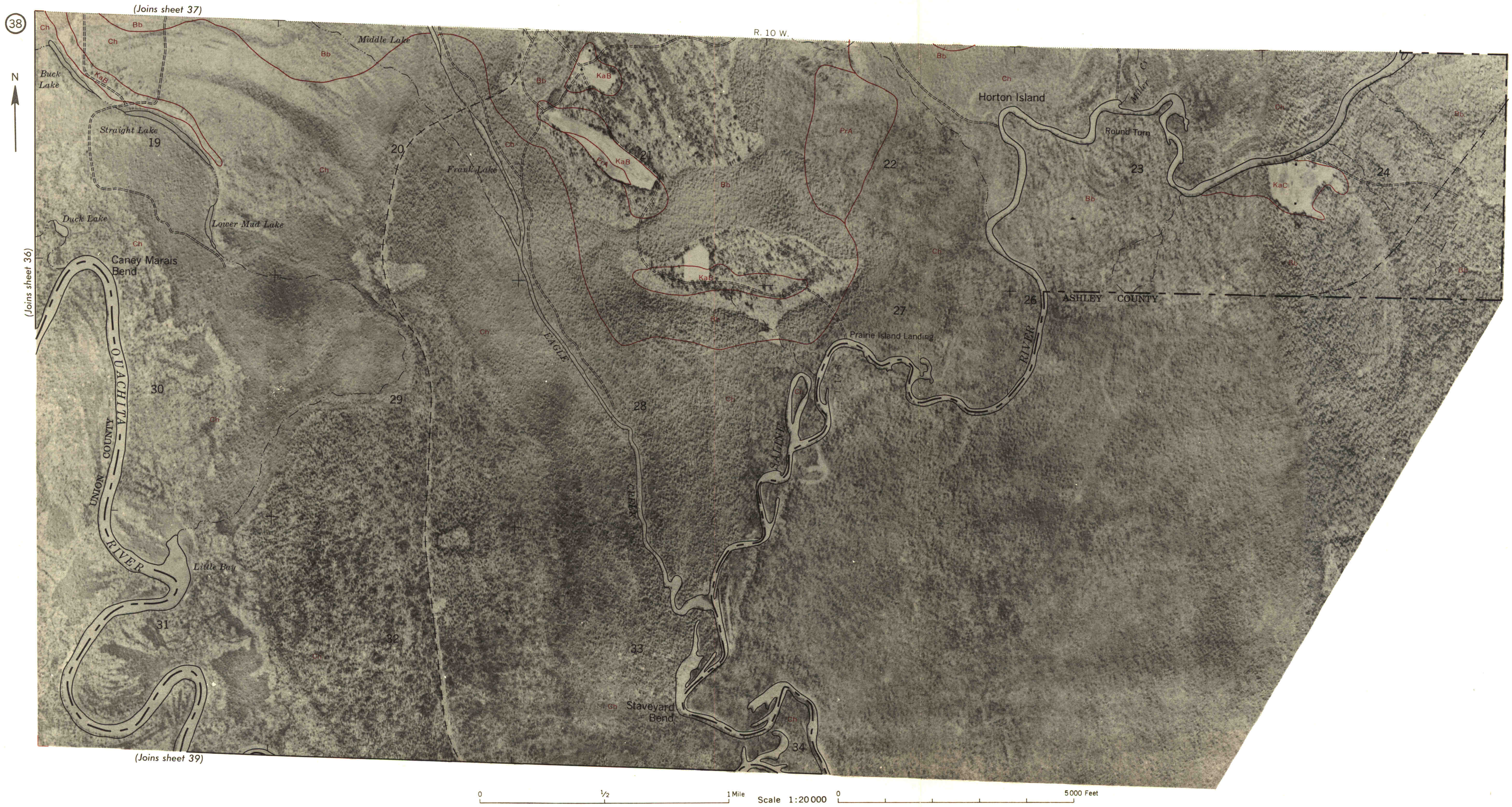
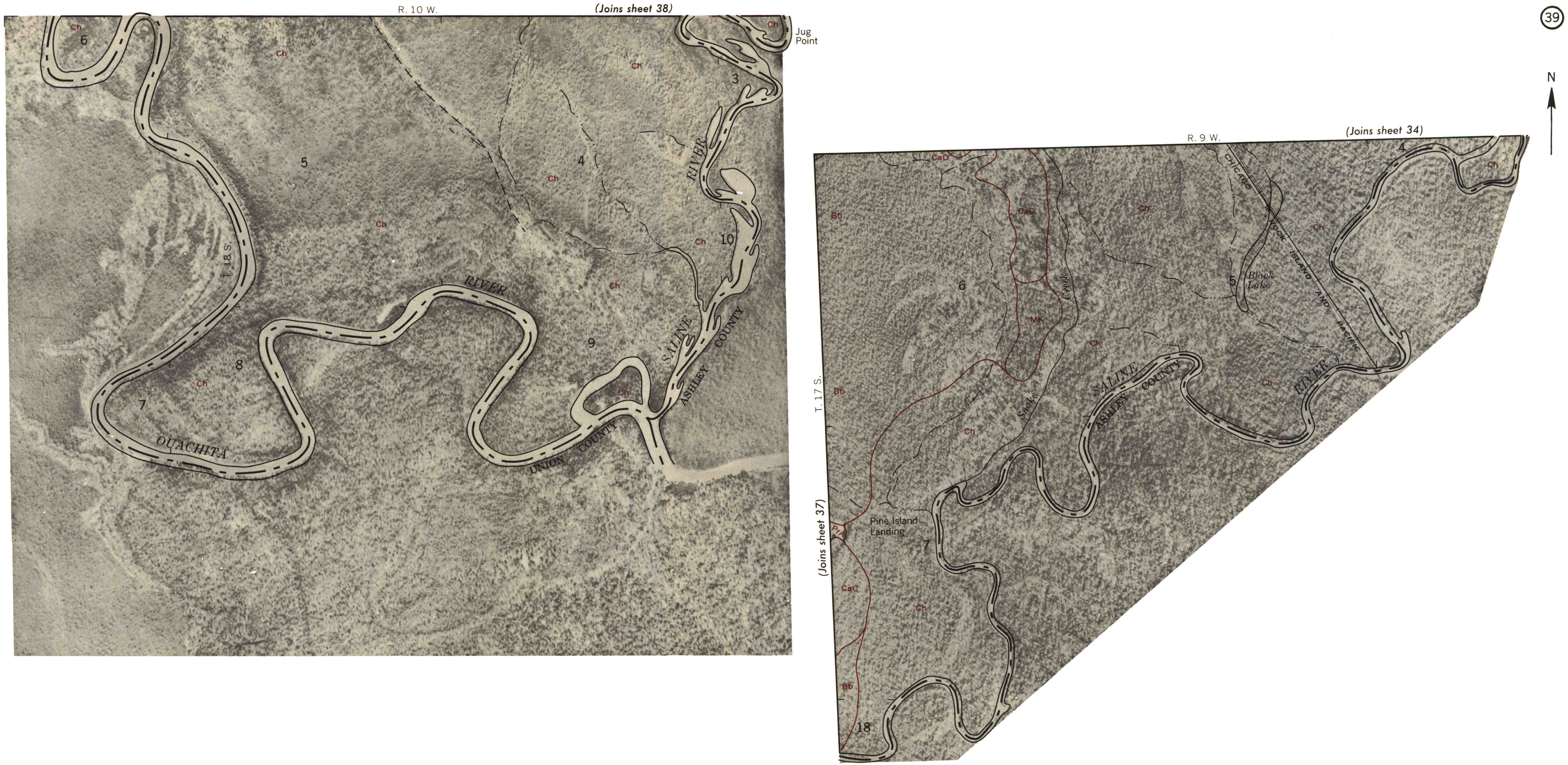


0 1/2 1 Mile Scale 1:20000 0 5000 Feet


38
(Joins sheet 37)
(Joins sheet 36)
(Joins sheet 39)
N
R. 10 W.
Buck Lake
Straight Lake
Middle Lake
Frank Lake
Lower Mud Lake
Duck Lake
Caney Marais Bend
Horton Island
Round Turn
Miller Cr.
Prairie Island Landing
ASHLEY COUNTY
UNION COUNTY
OUACHITA RIVER
SALINE RIVER
EAGLE CREEK
Little Bay
Staveyard Bend
19
20
21
22
23
24
26
27
28
29
30
31
32
33
34
Ch
Bb
KaB
KaC
PrA
0
1/2
1 Mile
Scale 1:20 000
0
5000 Feet



0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

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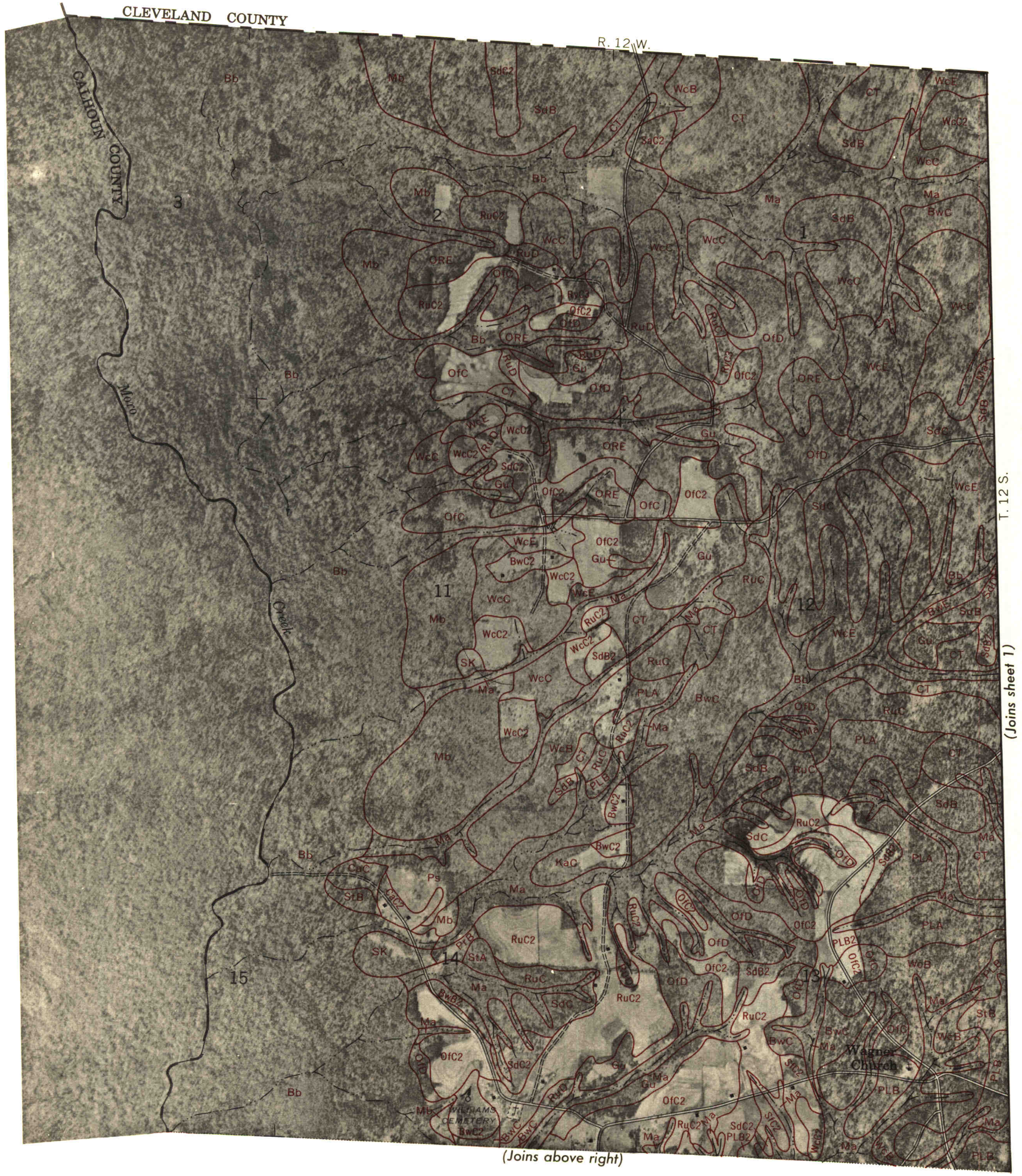
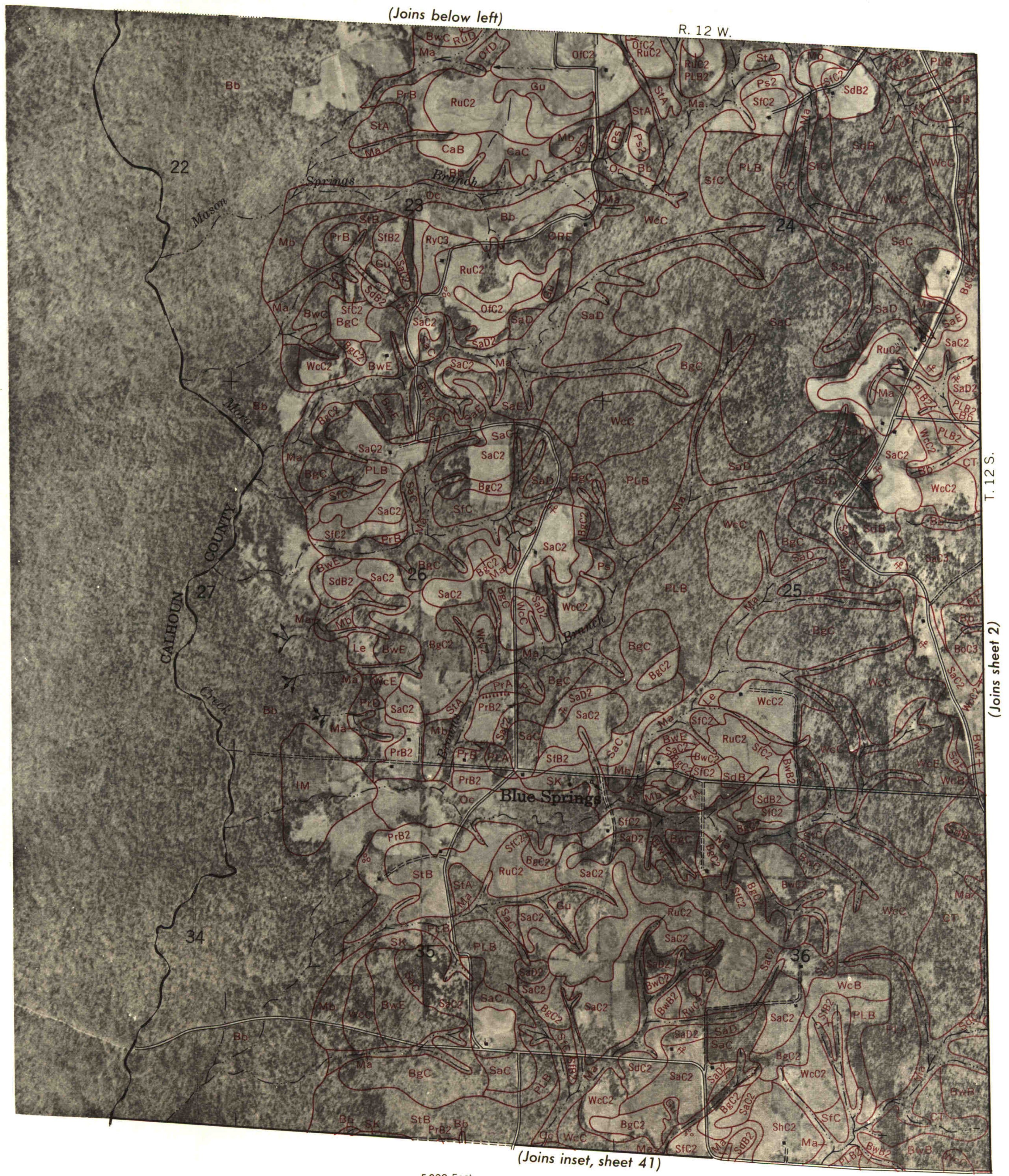
40

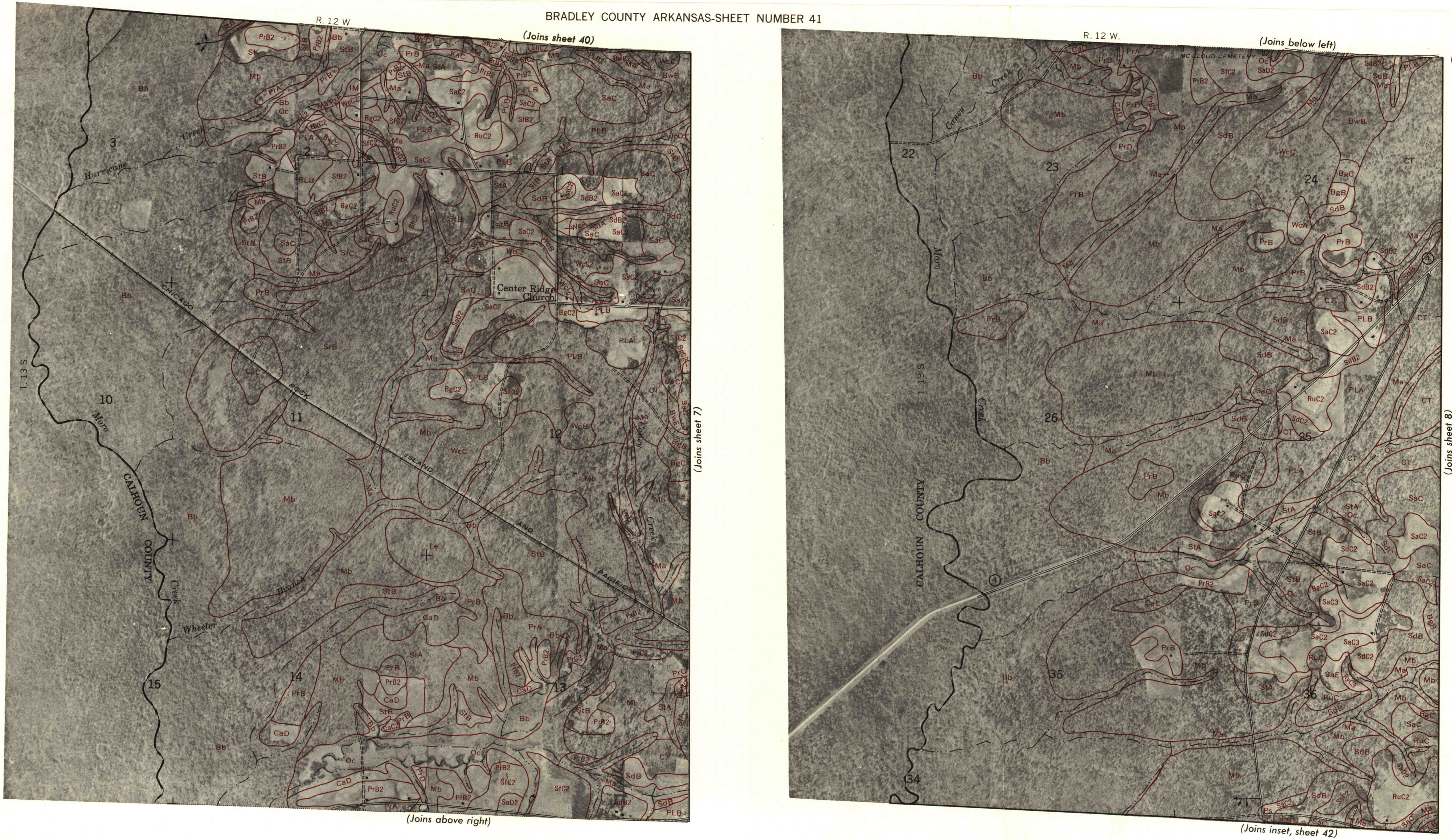




0 ½ 1 Mile

Scale 1:20000

0 5000 Feet



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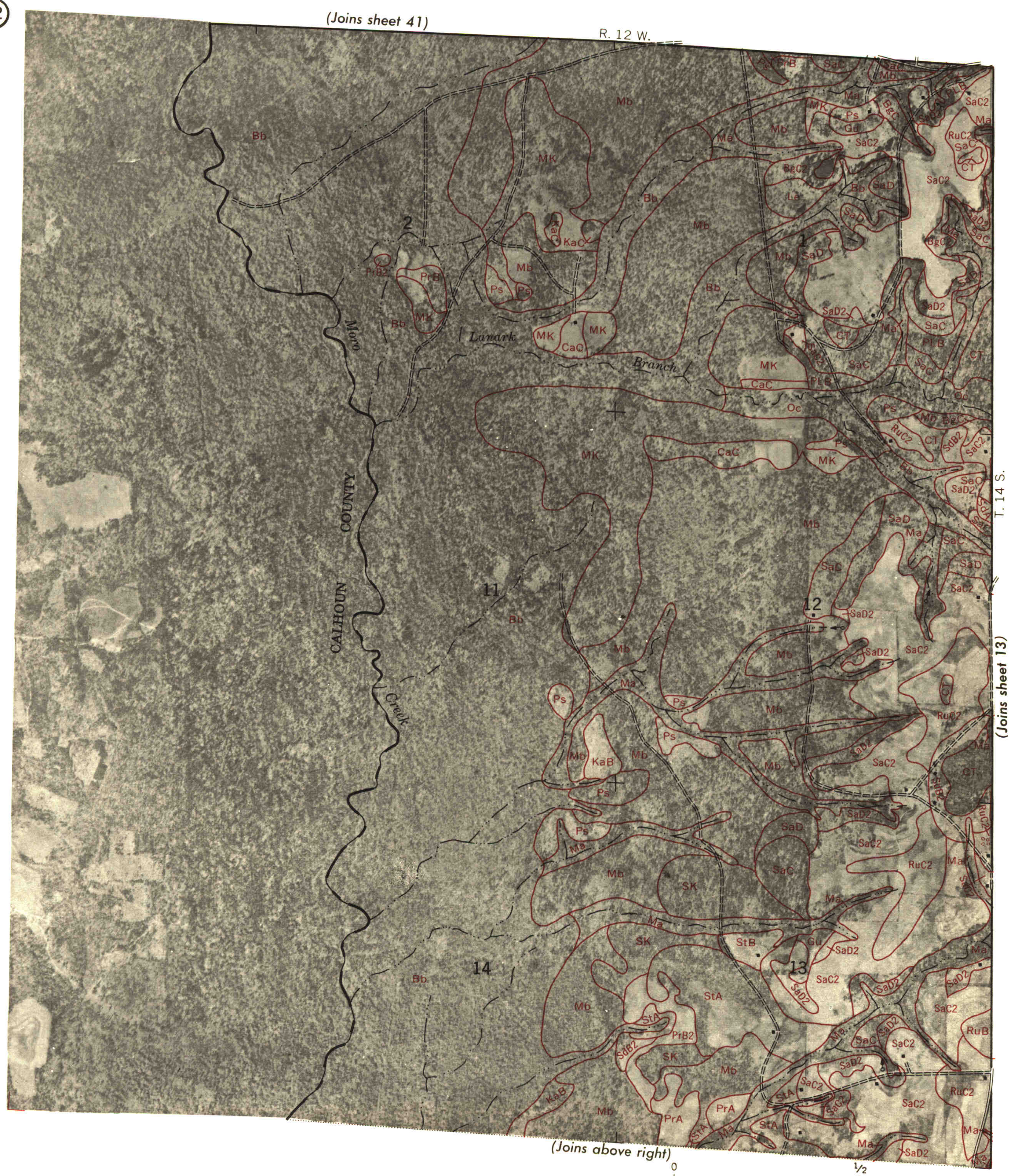
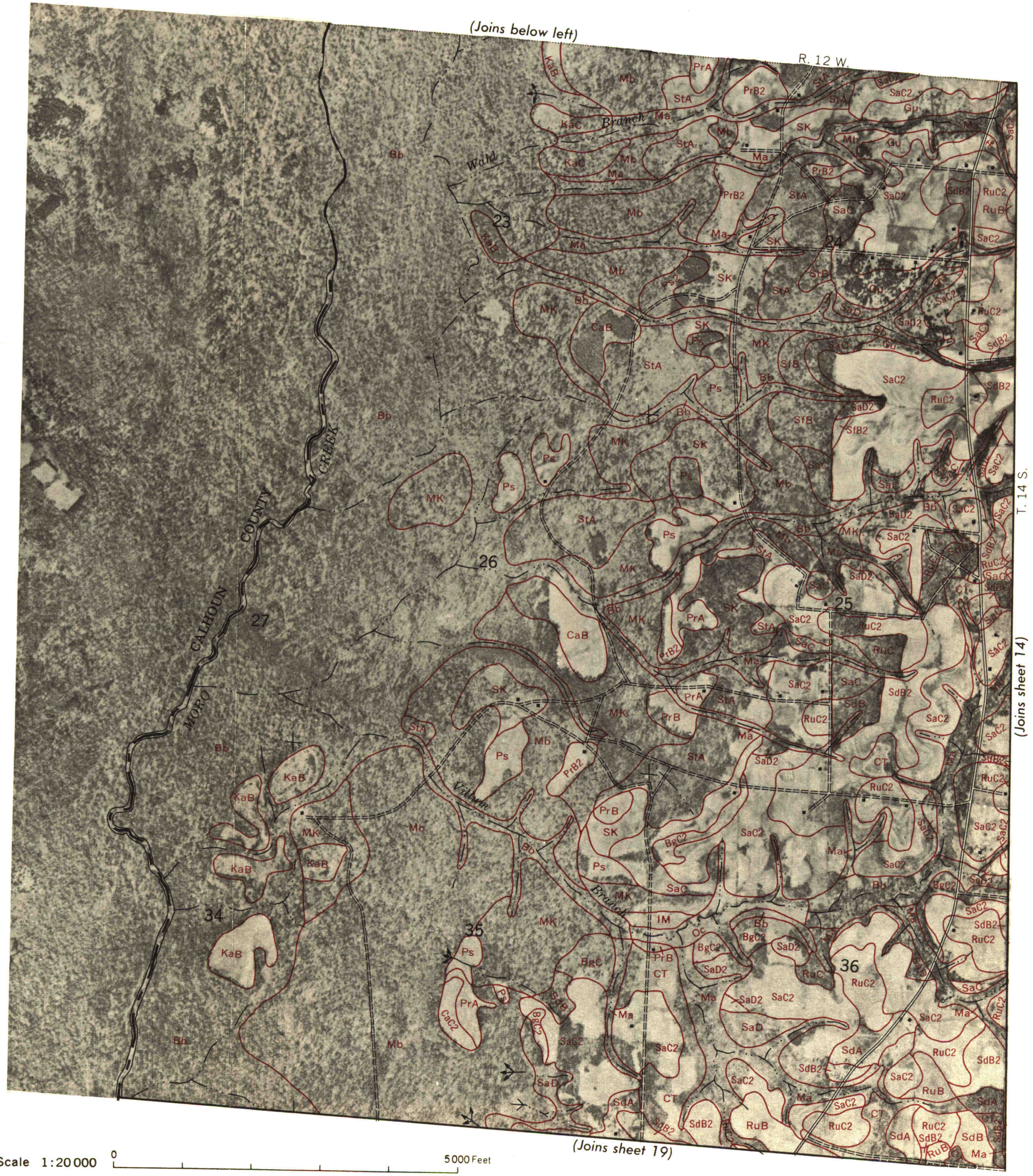
Range, township, and section corners shown on this map are indefinite.

Scale 1:20 000 — 0, ½, 1 Mile; 0, 5000 Feet

42

N





0 1/2 1 Mile

Scale 1:20000

0 5000 Feet